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Test Your Piloting IQ
- FAR Refresher ..... Inside Back Cover

On the cover:
The Alaska Highway through Canada provides navigational guidance, spectacular scenery, and the "world's longest runway" if needed. Taken from a Alaska Highway Rendezvous '92 Society poster.

NATIONAL BUSINESS AIRCRAFT ASSOCIATION, INC.

by Dean Chamberlain
Associate Editor

NBAA. What is it? What does it do? According to Pete West, NBAA's Vice President of Government and Public Affairs, the National Business Aircraft Association is the principal representative of business aviation in the United States. NBAA represents nearly 7,000 businesses and corporations that own and operate nearly 5,000 aircraft for business purposes, as well as companies which service and supply business aviation.

NBAA's membership rolls read like a "Who's Who" of world business. Its Board of Directors' companies read like the Fortune 500 list of top businesses in America. Some of the largest corporate flight departments in the country are members of NBAA. Although some of the largest corporations in America are members of NBAA, not every member company is large or flies large business jets or turboprops. Many members are small companies, and scattered throughout the business aircraft fleet are many Cessna 172's, 182's, and Piper PA-28's. Thus, NBAA serves the needs of all business aircraft operators, both large and small. NBAA provides important services and benefits to the "small" business operator who may lack the resources that only group membership can provide. So why do both large and small companies join NBAA? One reason is the complexity and competition in today's aviation environment. Historically, when Congress tasked the Federal Aviation Administration (FAA) with promoting and regulating aviation within the United States, aviation was much simpler, and there were fewer aircraft flying at slower speeds. Today, the operational complexity of the airspace and number of aircraft using it produce many differing user needs. As a result, each group of operators using the National Airspace System has formed its own group to promote its own unique needs and goals. That is why there are so many "alphabet groups," as they are known within the aviation community. Groups such as AOPA (Aircraft Owners and Pilots Association), EAA (Experimental Aircraft Association), HAI (Helicopter Association International), AHS (American Helicopter Association), the 99's, and the Whirly-Girls, which *FAA Aviation News* has highlighted in previous articles in this "FAA and Industry Special Series," all exist to serve the special needs and desires of their members.

At times the varied needs of each group seem to be at odds with the needs of one or more of the other groups and outside agencies. Each group then works with the FAA, Congress, other government agencies, both local, state, and federal, and each other to resolve the issues impacting their respective members. Each group also provides important services for its members. They all provide for and promote safety programs, good operating procedures, good management practices, and other items of interest for their members based upon their own unique operating needs. NBAA represents the needs of the business community. This is the story of how the Association promotes the business use of aircraft in the United States and around the world, and how it works with the U.S. Congress, the Executive Branch, the FAA, and state and local governments to resolve issues affecting business aircraft operators today.

NBAA provides aggressive political leadership as well as the various technical services that support business flying that many of its members could not afford individually. Some of those services include working with the FAA on matters of safety, air traffic control, regulatory changes, airport access and noise, as well as other changes within the National Airspace System. In addition to working with the FAA, NBAA also works with Congress on matters such as taxation, airport and airspace access, environmental issues, airport security, product liability, and the unique problems of international business concerns and their access to world airports. Many of these concerns are similar to those of the other organizations we have discussed in past issues. Because of this shared interest, NBAA works with many of the other groups and the FAA in finding

Familiar names of aviation support and services companies are exhibited at NBAA's annual convention.

Photo Courtesy of NBAA

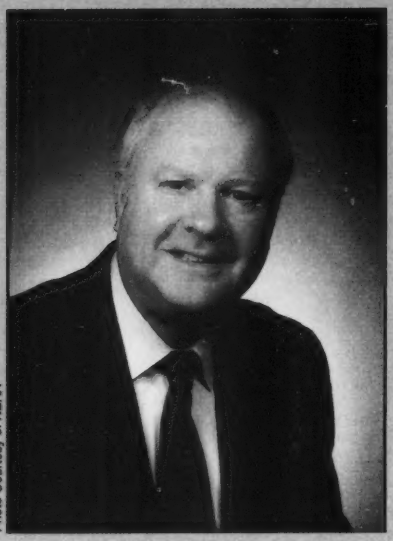


Photo Courtesy of NBAA

NBAA President Jonathan Howe.

solutions to their mutual problems affecting aviation in general and general aviation in particular.

Just because a corporation flies a B-727 or a Gulfstream G-IV business jet does not mean the corporation is not a part of general aviation. Many people do not realize that business or corporate flying is part of general aviation, i.e., they operate under FAR Part 91 or FAR Part 125. The challenge for NBAA is how to serve the varied needs of business flying when the companies use such different aircraft that range from, say, a C-152 to a B-727.

NBAA's president, Jonathan Howe, is one of those who works hard at resolving many of these problems and providing many of the needs. His experience both as a former FAA regional director in the Southern Region and as a lawyer provides him with the aviation insight and the legal background needed to represent business aviation's interests on many of the advisory boards on which NBAA serves before the FAA, the NTSB, and Congress. He chairs the FAA/Industry Aviation Rulemaking Advisory Committee (ARAC). (ARAC involves several working groups composed of aviation industry individuals who meet regularly and draft Notices of Proposed Rulemaking, final rules, and advisory circulars under FAA advisement.) Mr. Howe's dedication to aviation was recently recognized by FAA Administrator James Busey at the NBAA Annual Meeting and Convention. In addition to Mr. Howe's efforts, others on NBAA's staff provide technical support for both members and the various regulatory agencies involved in aviation. Together, Mr. Howe and his staff provide a forum for business aviation interests both in Washington and around the country.

No discussion of business or corporate aviation would be complete without talking about its role in developing new technology. Traditionally, corporate aviation leads civil aviation in using new products. Electronic or "glass" cockpits, Loran-C, GPS navigation, and many other innovations first flew in general aviation aircraft. Large businesses can afford to be the first to buy the latest equipment available to meet their needs for safe, dependable on-demand transportation. NBAA supports those needs through its sponsorship of two important functions. First, NBAA sponsors its Annual Meeting and Convention, which includes one of the largest displays of new aircraft and related products and services from companies around the world.

Just as important as being first to use a new product is the safe, efficient use of that product. That function—safety and the exchange of good operating information within the business community—is an important part of NBAA and the Convention. The Convention provides the means of both promoting safety and recognizing those members who have safe flight programs. Each year as part of its safety awards program, NBAA recognizes those member companies and their employees who met NBAA safety standards during the previous year. This year NBAA recognized 306 companies for their combined 6,442,194 safe flying hours over the years. Some of the companies' safe flying records extend back more than 40 years. In addition to recognizing companies, NBAA recognized 1,096 individual pilots for their combined 6,903,479 safe total flight hours, 106 companies for their aviation maintenance departments, 514 maintenance and avionics technicians for their years of safe work, and 412 recipients of awards for providing safe support services. In addition to its safety awards, NBAA held forums on such topics as safety, management techniques, technical developments, maintenance, changes within the National Airspace System and the FAA, and other topics of interest within general aviation and the unique world of business flight. ■

For more information on services NBAA provides its members you can write to the National Business Aircraft Association, Inc., 1200 Eighteenth Street, NW, Suite 200, Washington, DC 20036-2598. Telephone: (202) 783-9000. FAX: (202) 331-8364.

Corporate pilots attend an NBAA-sponsored technical session that emphasizes safe operating practices for business flying. NBAA holds numerous safety seminars and meetings at its convention and welcomes FAA participation as presenters and resources.

Photo Courtesy of NBAA

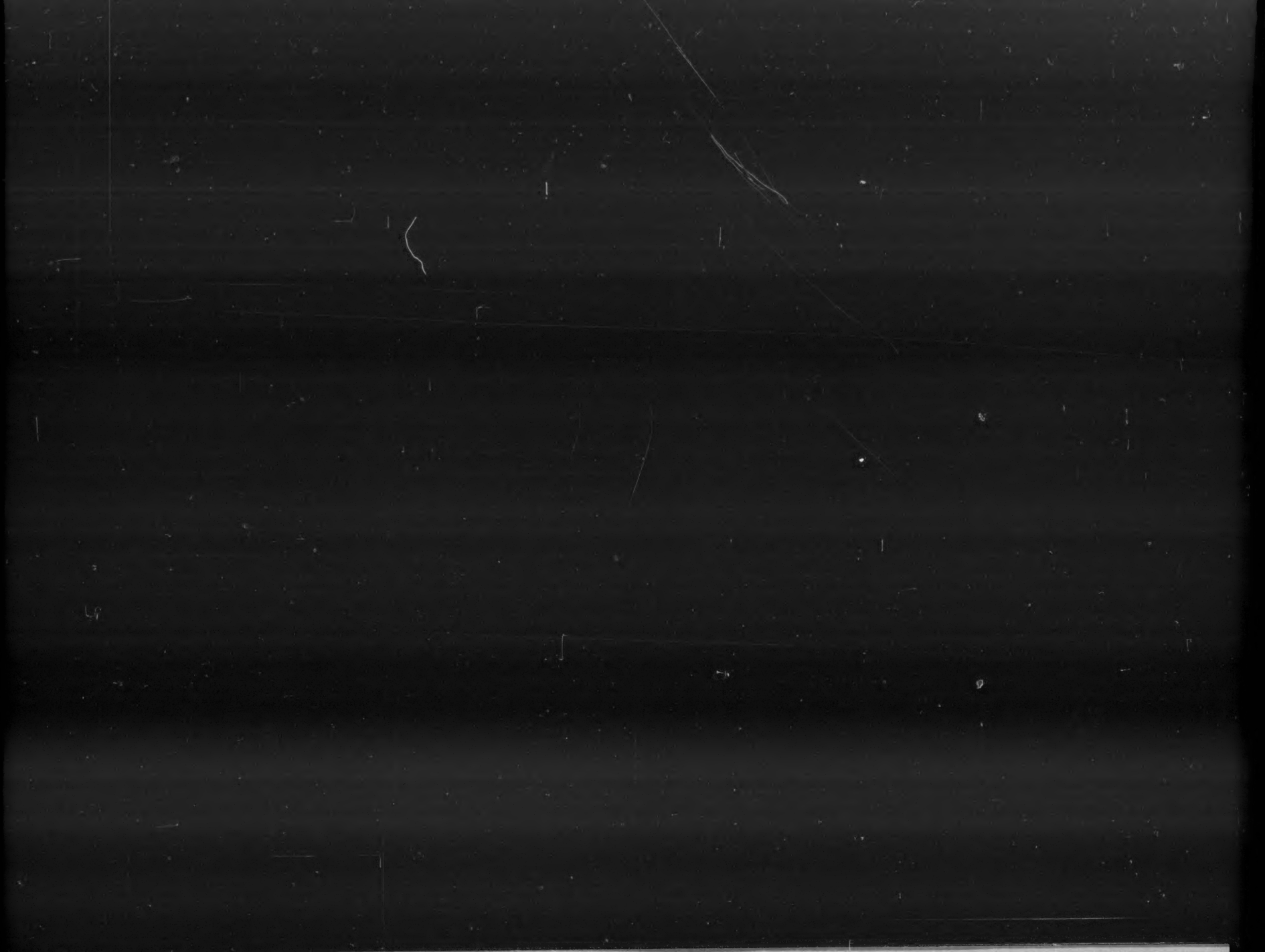


Photo Courtesy of Piper Aircraft

WINTER FLYING

Some Thoughts on Being Winter-Wise

This Piper Turbo Arrow IV is well-equipped to maintain a comfortable cockpit environment for winter flying. However, the turbo-charged engine requires some extra care during winter operations. For any airplane, consult the POH or AFM for winterizing procedures.

There are not many places in the U.S. much colder than Montana in the winter, so we turn to Jim Cooney, the Accident Prevention Program Manager at the Helena Flight Standards District Office for our winter flying reminders. His article was first published in "Sky Waves," the Accident Prevention Program newsletter he publishes quarterly. You might also check the FAA Aviation News *reprint, "Are You Ready for Winter" available from your local APPM. Being prepared for winter flying is very important, especially for pilots whose only winter trip was to take the family to the grandparents' house for the Holidays. Do what you can to make sure that trip and any post-Holiday ones are safe. — Editor*

by Jim Cooney

Winter in Montana can place some very demanding challenges on aircraft and pilots. Have you gone through a mental checklist to see if you have taken into consideration what changes you should make in your flying habits to cope with the weather?

Winter brings changeable weather with fast-moving fronts, strong and gusty winds, blowing and drifting snow, and icing. This calls for good judgement, caution, changing some habits, and caring for your aircraft. So much for the generalities; let us get down to specifics . . .

Winter Care for Your Aircraft

First, have you followed the manufacturer's recommendations for winterizing your aircraft?

Are you using recommended engine baffling and covers?

Have you had your mechanic check the aircraft breather system, all hoses, flexible tubing, and seals for signs of deterioration? How about tightening loose clamps and fittings?

Have you removed wheel covers to reduce the chance of frozen slush locking the wheels and brakes?

Have you had the heater system checked for leaks (CO)?

If your aircraft is parked outdoors, do you use covers for at least the pitot, engine, and wings?

If possible, do you top off after landing to reduce condensation in the fuel system—condensation that can freeze?

Have you checked the condition of your battery? Remember that in certain instances your life could depend on the condition of your aircraft's battery and/or your ELT battery.

Be Weather Wise

Winter weather is not more hazardous—*if you are prepared*—but it is different and a trifle unforgiving. You will be better prepared for any eventuality if you take the following precautions:

Plan carefully. Do your really understand the forecast? Prepare alternate ways out in case you run into a problem or into unexpected weather.

Allow for a shorter day, i.e., fewer hours of daylight. Make sure you are night current.

Carry a safe margin of fuel for any change in plans, and that may mean more than the required VFR or IFR minimums. Do not assume that the only option you have is to go to your original destination.

Drain enough fuel for a proper contamination check. If the fuel does not drain freely, suspect ice in the line or sump.

Make sure that your ELT is checked and on frequency—best done by a radio shop but you can check aircraft logs.

Make sure that snow and frost is cleared from all lift and control surfaces. Even a little frost can destroy lift. Also check to be sure the pitot tube, heater intake, fuel vents, and carb intake are all free of snow or ice.

File a flight plan and *follow* your filed flight plan.

Dress for weather outside the cockpit. You could have a heater failure, not to mention an emergency landing.

Carry survival gear, a first aid kit, and blankets or sleeping bags.

Monitor weather broadcasts, request (and provide) PIREPS, and get forecast updates en route (Flight Watch is 122.0).

Watch for the warning signs of weather ahead: Clouds, indefinite horizon, wind and temperature changes, cars using headlights during the daytime (may mean blowing snow).

Know what whiteout is, especially if you fly over large frozen lakes or snow covered terrain with no contrasting features. Snow-covered featureless terrain can blend into an overcast sky; the horizon disappears, disorientation sets in quickly, and height perception is lost. Can you handle flight in actual instrument conditions?

Be alert for carb icing.

Warm the engine periodically during low power descents and approaches and when practicing power-reduced maneuvers.

Remember, legal visibility minimums may not necessarily be safe minimums for you. Set yourself reasonable limits and stick to them otherwise you could be tempted into pressing on into bad weather. Many mountain flying experts indicate they would not consider flying VFR in the mountains in winter with less than five miles of visibility.

Carbon Monoxide

Do not count on fumes from a leaky heater to warn you of carbon monoxide poisoning. It may be impossible to detect it before it is too late. Your best bet is to have a carbon monoxide detector of some sort in your aircraft. Several types are available for a very small cost.

Even if you have a detector, always be alert for the signs of carbon monoxide poisoning: Sluggishness, warmth, tightness across the forehead, headache, ringing in the ears, nausea, dizziness, and dimming vision. If *any* of these symptoms occur, shut off the cabin heat, open a fresh air source, do not smoke (it will only aggravate your condition), use 100% oxygen if available, talk to ATC to get their assistance if practical, and land as soon as possible.

Have a safe flight and a happy winter flying season. ■

Pilot Operations at Uncontrolled Airports

Don't Let Uncontrolled Mean Out Of Control

Photo by FAA Inspector Jake Wilson

Too close for comfort. Pilots and passengers of both this Cessna152 and Piper Warrior walked unharmed from this atypical uncontrolled airport midair. This is an "embrace" we all want to avoid.

by Larry Craig

Can you picture yourself as the pilot of one of these airplanes? Probably not, right? This type of mishap always happens to other pilots, not to you. Well, believe me, it could happen to you just as it happened to these two pilots. Usually, we hear the potential for this type of accident is a low-wing on top of a high-wing, but this time just the opposite happened.

The student pilot of the low wing Piper (Note: we still have high wing Pipers) was on a solo crosscountry and had just flown an extended final to Runway 03. The locally-based Cessna student pilot had just flown a right downwind and base per the airport segmented circle. However, as the Piper touched down, the Cessna landed right on top of it.

Witnesses said both pilots made radio-position reports, but the Cessna pilot said he never heard any reports from the Piper. He also said at no time did he ever see the Piper. The Piper pilot said he saw the Cessna when it was downwind, but decided it would not be a factor in his landing. Fortunately, there were no injuries to either pilot.

Airplane operations at uncontrolled airports have long been of concern to the FAA. The propensity of aircraft to run into each other has probably been around ever since Orville and Wilbur built their second airplane. As pilots, we love to carry on about the "big sky," but the airspace around uncontrolled airports can be anything but.

If we learned to fly at an uncontrolled airport, one of the first things we should have learned was to fly a standard traffic pattern. However, if we learned to fly from a controlled airport, we may be accustomed to receiving instructions from the controllers, sometimes regardless of published traffic patterns. As a result some of us really disliked flying into those uncontrolled fields where you had to make all the decisions with little help. It seems like the longer we fly the tendency to make nonstandard patterns at uncontrolled airports to save time becomes a way of life. After all, one of the reasons we fly is to save time. Taking a shortcut by flying a nonstandard pattern may save you some time, but in reality it increases your chances of a collision with another aircraft. FAR Part 91 provides some rather scanty guidance on uncontrolled airport operations. Basically FAR §§ 91.113(g) and 91.127 simply state that the aircraft on final approach has the right of way and airplanes approaching to land shall make all turns to the left, unless otherwise indicated.

Chapter 4, Section 3, Airport Operations, of the *Airman's Information Manual*, provides some good guidance on uncontrolled airport operations, and Advisory Circular (AC) 90-42F, "Traffic Advisory Practices at Airports without Operating Control Towers," also has good information on radio frequencies. AC 90-66, "Recommended Standard Traffic Patterns for Airplane Operations at Uncontrolled Airports," has excellent guidance on traffic pattern entries and other uncontrolled field operations. A review of these publications should be mandatory in pilot training and during BFR's.

FYI

There is an excellent video recently published by the FAA and AOPA entitled "Pilot Operations at Non-towered Airports." Be sure to attend one of the safety seminars put on by your Accident Prevention Program Manager where this video will soon be presented. Or visit your local FSDO and ask to view it there.

We can avoid unpleasant situations such as in the picture if we observe several basic rules at uncontrolled airports:

1. Fly a traffic pattern as recommended by AC 90-66. Be at pattern altitude (AC 90-66 recommends 1,000 feet AGL) before you enter the traffic pattern, and use the mid-field 45 degree downwind entry. This allows you to fit into the traffic flow with a minimum of inconvenience to you and your fellow pilots. By the way, be alert for airports with nonstandard traffic patterns. Learn traffic pattern altitudes and direction from the *Airport/Facility Directory* or via UNICOM contact, segmented circle, observed traffic, etc.
2. Try to avoid long straight-in finals or abbreviated base legs. Although you may save time, it can wreak havoc for other pilots flying a standard pattern in trying to locate you or having to extend themselves on downwind, etc.
3. Be courteous! You may be in the right, but do not end up "dead" right—you must be on your toes all the time.
4. Use your radio, but do not be completely dependent upon it. You may be calling in your positions, but others may not be listening.
5. FAR Part 137 allows agricultural aircraft operators to fly non-standard traffic patterns at uncontrolled airports, so be on the lookout for them, even though they are supposed to give way to traffic in the normal pattern.
6. If you are remaining in the pattern, do not start your crosswind leg until you are at a safe operating altitude. This will ensure that you will enter the downwind leg at pattern altitude.
7. If you are departing the traffic pattern, continue straight out or exit with a 45-degree left turn (right turn for a right traffic pattern) when beyond the departure end of the runway after reaching pattern altitude.
8. Finally, and probably the best rule, keep your head and eyes on a swivel—look out for other traffic!

To paraphase an old, tried—but true—statement, watch out for the other pilot; they may not be watching out for you! ■

Editor's Note: Larry Craig is the Accident Prevention Program Manager at the Lincoln, Nebraska, FSDO.

FEDERAL AVIATION REGULATIONS

FAR § 91.113(g) states:

Landing. Aircraft, while on final approach to land or while landing, have the right of way over other aircraft in flight or operating on the surface, except that they shall not take advantage of this rule to force an aircraft off the runway surface which has already landed and is attempting to make way for an aircraft on final approach. When two or more aircraft are approaching an airport for the purpose of landing, the aircraft at the lower altitude has the right of way, but it shall not take advantage of this rule to cut in front of another which is on final approach to land or to overtake that aircraft.

and FAR § 91.127 states:

(a) Unless otherwise required by Part 93 (Special Air Traffic Rules and Airport Traffic Patterns) of this chapter, each person operating an aircraft on or in the vicinity of an airport shall comply with the requirements of this section and, if applicable, of FAR § 91.129.

(b) Each person operating an aircraft to or from an airport without an operating control tower shall—

(1) In the case of an airplane approaching to land, make all turns of that airplane to the left unless the airport displays approved light signals or visual markings indicating that turns should be made to the right, in which case the pilot shall make all turns to the right;

(2) In the case of a helicopter approaching to land, avoid the flow of fixed-wing aircraft; and

(3) In the case of an aircraft departing the airport, comply with any traffic patterns established for that airport in FAR Part 93.

(c) Unless otherwise authorized or required by ATC, no person may operate an aircraft within an airport traffic area except for the purpose of landing at, or taking off from, an airport within that area. ATC authorization may be given as individual approval of specific operations or may be contained in written agreements between airport users and the tower concerned.

Famous Flyers

The Loughead Brothers

What Famous U.S. Aircraft Company Resulted from a Mispronounced Name?

Malcolm (left) and Allan (right) Loughead in their F-1 flying boat.

by Louise Oertly, Associate Editor

It gets tiresome having to correct people on the proper pronunciation of your name. It is bad enough when it is an understandably difficult spelling, but when people keep calling you "loghead" it is time to take action.

The story begins in the early 1900's with three Scottish brothers from California—Victor and his half-brothers Allan, and Malcolm Loughead. Victor was working in Chicago as an automotive engineer. With his help 21-year-old Allan found a job in Chicago as an automobile mechanic and while there became interested in aviation. By the time Allan returned to San Francisco a year later, in 1911, he had learned to fly, had a working knowledge of aircraft design, and had plans to build an aircraft.

Teaming up with his brother Malcolm, another automobile mechanic, they decided to try their hand at building their own airplane. Knowing they would need financial backing they convinced Max Mamlock, the owner of Alco Cab Company, to underwrite the expenses and in 1912 the Alco Hydro-Aeroplane Company was formed.

The plans called for a three-place flying boat dubbed the Model G. (This would give the impression that G was one of many designs, instead of their first venture in aircraft building.) The design featured a biplane with midwing ailerons located between two outboard interplane struts of each wing. Instead of a rudder and elevator, the entire tail swung on a universal joint. The center flotation gear was built like a sled without a step and on the lower wings were outrigger floats. The biplane was powered by a 80-hp water-cooled Curtiss V-8 engine located tractor style in front of the cockpit.

After months of hard work Model G was successfully launched on June 15, 1913. Allan flew the maiden flight over the waters of the Golden Gate. He landed, picked up brother Malcolm, and for the next 20 minutes flew over a 10 mile area around Alcatraz, Nob Hill, and Market Street.

Since the Model G was a "flying boat," the brothers decided it would be perfect to ferry passengers around the Bay area. A windfall came their way when they won the flying concession for the 1915 Panama-Pacific Exposition. For the next 50 days they carried over 600 passengers at $10 a head for a 10 minute ride. They netted about $4,000 and decided it was time to build another, larger airplane. With enough capital of their own, they no longer needed the Alco Cab Company, so they formed the Loughead Aircraft Manufacturing Company and moved to Santa Barbara.

After getting additional backing from a machine shop owner, the brothers began work on a 10-passenger, twin-engine flying boat. This time the craft would be called the F-1 and be one of the world's largest seaplanes. It was made of wood and fabric with an upper wing span of 74 feet. The lower 47-foot wing span carried pontoons at each tip. The two 160-hp Hall-Scott water-cooled engines were installed between the wings on either side of the hull.

During the construction of the F-1, the son of a local contractor walked in and asked for a job. The 20-year-old man was an architectural draftsman and part-time automobile mechanic. He had also been bitten by the aviation bug, had taught himself the elements of stress analysis, and was willing to do anything as long as it was in aviation. The brothers apprenticed him to work on the hull, but before the project was over he had redesigned the craft's 74-foot upper wing structure. This marked the career start of another of aviation's giants—John K. Northrop.

By the time the F-1 was completed the U.S. had entered World War I. Loughead put in its bid for a Navy seaplane contract. However, the Navy had already chosen the Curtiss HS-2L as its standard design, so instead the Navy contracted with Loughead to build two seaplanes to the HS-2L specifications. Eventually, they converted the F-1 to a landplane.

With war's end the Loughead's decided to develop what they hoped would be the "Model T of the air." The small, inexpensive single-engine airplane would be known as the S-1 *Sport Biplane*. It was an advanced design using a streamlined wooden monocoque (single shell) fuselage and weighed only 800 lbs. fully loaded. The two-cylinder water-cooled engine delivered 25 hp and would run for an hour on a gallon of gas.

Installed on this airplane was a speed brake system for short runway landings that Northrop had developed based on his

Continued on page 23

Photo by Fred Hirschmann

A de Havilland Otter passes over the braided channels of the Susitna River en route to Anchorage. Alaskan and Canadian terrain can pose a navigational challenge to anyone not proficient in pilotage.

Flying to ALASKA *-An Overview*

by Dean Chamberlain, Associate Editor

This article is dedicated to the men and women who built "The Road." Happy 50th Anniversary from the staff of FAA Aviation News.
—Editor

The magnificent scenery and independent lifestyle of Alaska have lured many people to America's "last frontier." Long after the gold ran out and the pipeline was finished, people still travel to Alaska to see some of the last remaining unspoiled flora and fauna. Tour boats and ocean liners advertise sea voyages to the bases of glaciers to watch icebergs calving, but probably the most exciting and spectacular way to get to Alaska and see its wonders is by personal airplane. If you fly yourself to Alaska, whether by the overland route or up the "Inside Passage," it promises to be the trip of a lifetime. And like any trip of such proportions, it requires exquisitely careful planning and preparation.

Why? Because what makes Alaska unique as a aerial sightseeing adventure also makes it challenging to the skills of a "Lower 48" pilot, especially one without mountain flying experience. Pilots who have flown only within the contiguous 48 states are simply not prepared for the extreme contrasts of terrain and weather that may be encountered in northwest Canada or for the dearth of human habitation or landmarks. "Sparsely settled" is the term used by Canadians to describe most of their land, and in many areas that is an understatement. The average number of human beings encountered is less that one person per square mile. This compares to an average of just over 60 persons per square mile in the U.S. Consequently, the pilot who has the misfortune to crash land away from the settled areas could end up waiting a while for rescue. Frosty nights, even in summer, and daytime predators, ranging from swarming insects to the occasional ursine (bear), could add to survivors' problems.

The land mass confronting the pilot who is Alaska-bound is a seemingly endless sprawl of mountains, some of which are permanently snow-capped. The highest Canadian mountains are along the Pacific coast, ranging up to nearly 20,000 feet near the Alaskan border. Inland there are the northern Rockies cut through by countless river valleys, with branching streams flowing in all directions. The complexity of the Canadian mountain ranges makes it difficult for small aircraft with service ceilings on the low side. The pilot must depend on visual reference and pilotage, supplemented where available by VOR and ADF radio navigation unless the aircraft and the pilot have the capability and willingness to fly IFR safely over the peaks, where most MEA's are over 10,000 feet MSL.

The overland terrain is dominated by two major mountain ranges, the Rocky Mountains and the Coastal Mountains, which extend in a northwesterly direction roughly parallel to one another. The coast has the highest peaks, ranging over 20,000 feet, and numerous glaciers; it hugs the coastline and forms a solid barrier from Vancouver, British Columbia, to Valdez, Alaska.

The Rocky Mountain range is more extensive, with its highest mountains (located along the border between British Columbia and Alberta) reaching up to about 12,000 feet. Central interior British Columbia is somewhat flattened by the immense Fraser Plateau. Further north and west the Rockies again rub shoulders with the Coastal Range.

There is some farming and pastureland in the southernmost valleys of these two Canadian provinces, but most of this area is an almost continuous stretch of timberland, with some lakes and countless creeks but few roads or "natural" landing fields for wheel planes, even for taildraggers. Human habitations are few and far apart, and animals form the dominant population. Great country to visit, but no place to get lost in.

Canadian officials recommend summer and early fall as the most favorable seasons for flying up to Alaska. In the late fall and winter extreme cold (temperatures as low as 60° below zero have been recorded in the Yukon) and heavy snows are serious deterrents. In spring the weather may be pleasant, but the many unpaved landing strips may prove soggy and difficult to negotiate.

Radar coverage is virtually nonexistent along IFR routes in northern Canada to the Alaskan border; however, most major airports are equipped with an ILS. Fuel reserves for IFR or VFR flight must be carefully considered because of the long distances to alternate airports. Aviation fuel for low and high compression engines is usually available at airports along the well-travelled routes.

The prevalence of cloud layers in the overland valleys and coastal waters during much of the year may oblige the VFR pilot to fly at relatively low altitudes (VFR on top being illegal in Canada), but this may limit radio communication or navigation signal reception. The abundance of thick timber and uneven terrain underscores the problems of an emergency landing for the pilot who is unfamiliar with the country.

Few U.S. pilots realize the importance of making the trip north in easy stages. Medical officers for Transport Canada have estimated that two hours of low altitude navigation along the Alaska Highway can be the stress equivalent of a full day's VOR navigation in the States. The scarcity of what we consider social amenities in the far north places additional stress on some pilots and could affect their flying unless they take time to adjust their habits and feelings. There is a tendency to hurry on or fly in marginal weather simply because one feels out of place. For many experienced pilots, safe VFR conditions mean at least a 5,000-foot ceiling and five miles visibility.

What all of the above adds up to is this: American pilots are often sadly unprepared for the specific flight environments they encounter north of the Canadian border. The vast stretches of British Columbia, Alberta, and the Yukon Territory in Canada or the "Inside Passage" of the Canadian Pacific coast are routine aviation for veteran bush pilots but far from routine for others. The Canadians are happy to have U.S. aircraft flying over their territory to and from Alaska, but they are alarmed about the many pilots who embark on their adventure with little or no consideration for the demands it may make on their equipment, skills, navigational data, and overall ability to cope with a rather isolated and undeveloped environment. The result is often frustration and sometimes a serious or fatal accident. Every year about a half dozen accidents involving U.S. registered, general aviation aircraft occur in western Canada, principally in British Columbia and Alberta, according to figures supplied by Transport Canada, the Canadian counterpart of our Department of Transportation. About one out of five of these accidents is fatal, and many result in serious personal injuries and inevitable delays in locating the wreckage. The prevailing cause of these accidents can be summed up in a single phrase: *lack of preparation for coping with the conditions which may be encountered.* Key failings in this regard include:

- Lack of pilotage experience.
- Lack of appropriate charts.
- Unfamiliarity with non-directional beacons.
- Unfamiliarity with Canadian flight rules.
- Lack of adequate survival gear.

FLIGHT PLANS, ITINERARIES, AND NOTIFICATIONS

A flight plan in Canada is filed with air traffic control as in the U.S. The flight notification is similar except that it may cover a series of flights over a period of several days. Search activity is initiated if the aircraft is not heard from within 24 hours of a stated ETA. A flight itinerary may be filed in lieu of a flight plan or notification. The difference is that this itinerary is not filed with Canadian ATC but with a "responsible person." This person must agree to notify ATC or an FSS or a law enforcement office, etc., if the pilot fails to check in within 24 hours of an ETA or a time specified by the pilot.

AIRCRAFT ACCIDENTS

Pilots involved in an accident must notify Transport Canada officials who will then notify the FAA. The Transport Canada officials will probably inspect the site along with an Aircraft maintenance engineer to see if the aircraft can be ferried. If it is, they will normally issue a ferry permit to move the aircraft to the nearest Canadian repair base. Pilots wanting to return the aircraft to the U.S. for repairs will also need an FAA ferry permit.

PLANNING AND PREPARATION

If a flight to Alaska in your own plane is your dream, good planning and sensible preparation are the keys to making the dream come true. A safe, first-time flight to Alaska is possible and happens every year, but it is probably a trip that is months or perhaps years in the planning stages. Bearing in mind the accident causal factors above, here are a few things to consider before loading the aircraft with the camping gear and launching for the Great White North.

Navigation by Pilotage

The network of NAVAID's in the U.S. is so extensive that many U.S. pilots have had no recent experience in navigating solely by pilotage. When such pilots head north into the sparsely settled areas of Canada, where it is possible to fly for a hundred miles or more without passing a town, the problem of staying on course can become critical. The physical environment may contain few useful landmarks for the uninitiated. Many of the routes follow waterways or river valleys which appear to have an infinite number of forks and junctions. One wrong turn can lead the unwary pilot into a maze of twisting valleys amid steep mountain slopes that can culminate in a box canyon capped by an overcast.

The solution? Practice in your local area first, preferably with an instructor well-versed in pilotage. Use your pilotage skills on increasingly longer cross-country flights, and put off the Alaska trip until you are comfortable navigating without radio aids.

Charts

Apparently some American pilots are naive enough to imagine it is possible to find their way over Canada to Alaska simply by following the shoreline or highways with the aid of a roadmap alone or, worse yet, with an out-of-date chart. This is an open invitation to disaster. The area north of the border is so vast and the terrain so varied that even pilots with adequate aeronautical charts can get lost—by attempting short cuts or by mistaking a logging road for a gravel highway.

To fly the overland route VFR to Alaska you should have at least a dozen Canadian pilotage charts (similar to sectional charts but covering one-fourth the area) or a half dozen WAC charts. You should also have the appropriate U.S. sectional charts for Alaska from Ketchikan to Fairbanks, and you should study the Alaska Supplement to the *Airman's Information Manual* for required equipment and supplies,

INFORMATION SOURCES

The following Canadian and United States Government publications provide important information about flying in Canada and the United States. Please call for current pricing information on the charts and maps. For Canadian publications, payment must be in Canadian dollars. Some of the pamphlets and booklets are free.

Canada

Air Tourist Information-Canada (TP771E)
Transport Canada
AAN DHD
Ottawa, Ontario
CANADA K1A 0N8
(613) 991-9970
One of the best sources of information on flying in Canada, this booklet provides general information and specific information on how to order charts, flight supplements, and other important information needed for a safe flight.

Fiying the Alaska Highway in Canada
1991/92 edition
Director of Systems Safety
Transport Canada, Western Region
202-63 Airport Road
Edmonton, AB CANADA TSG OW6
(403) 495-3861; facsimile (403) 495-7355
One of the best sources of information on flying the Alaska Highway in Canada, this booklet provides information similar to the Air Tourist Information booklet, but geared specifically toward the Highway.

Charts and Other Aeronautical Publications

A.I.P. Canada
Similar to the U.S. *Airman's Information Manual*; issued every 56 days.

Canada Flight Supplement
Contains aerodrome/facility listings and operational information for IFR/VFR flight within Canadian airspace, including radio and emergency equipment requirements, communication data, navigational facilities, radar data, and special notices and procedures; issued every 56 days.

Water Aerodrome Supplement
Published for seaplane operations; revised annually.

The above publications are available from:
Canadian Government Publishing Centre
Supply and Services Canada
Ottawa, Ontario
CANADA K1A 0S9
(819) 997-2560

Recommended Navigation Charts

VFR Navigation Charts (VNC)
Scale 1:500,000
Alaska Highway, AIR 5099
Fort Nelson, VNC AIR 5022
Prince George, VNC AIR 5014

World Aeronautical Charts (WAC)
Scale 1:1,000,000
Edmonton-Fort Nelson, WAC D-12, D-13, E-15, and E-16
Fort Nelson-Whitehorse, WAC D-12

IFR Charts
Enroute Low Altitude including Terminal Area charts
LE 1-10, T 1-2 with wallet
LE 1-11, T 1-2 with wallet

Canada Air Pilot-West
Winnipeg and west; issued every 28 days

Charts can be purchased as a single issue or by annual subscription from Canada Map Office,Department of Energy, Mines, and Resources, 615 Booth Street, Ottawa, Ontario CANADA K1A 0E9; (613) 952-7000.

Charts can also be purchased from commercial outlets in Canada and at Canadian Flight Service Stations in British Columbia and the Yukon Territory.

recommended procedures, and general advice. However the most popular and helpful VFR chart for Alaska-bound pilots is the Alaska Highway chart. Canadian charts can be obtained at most airports and all flight service stations in the area.

IFR and VFR pilots traversing Canada should carry on board the *Canada Flight Supplement* (a combination of the former IFR, VFR, and Northern Supplements), which updates the aeronautical charts every 56 days and lists facility frequencies. The Supplement also contains a listing of about 1,200 airports in Canada, with sketches and summary details, and a wealth of other information on flight procedures, restrictions, and hazards to flying in Canada. Terminal area charts can be found in the *Canada Flight Supplement* for pilots flying into or near the major cities (e.g., Vancouver, Edmonton). Floatplane pilots should have the *Water Aerodrome Supplement.*

IFR qualified pilots should have the en route and approach charts appropriate for the route, as well as the *Canada Air Pilot— West* for supplemental information on airports with instrument approaches. Carry the approach charts even though you do not plan to file IFR, since a change in the weather may leave you with no alternative but an instrument landing. Canadian air traffic officials are repeatedly troubled by U.S. pilots asking for radar vectors in IFR conditions to an airport for which they have no approach plates on board and where radar is not available.

Non-Directional Beacons

Because our VOR network in the Lower 48 is so extensive, we tend to think of non-directional beacons (NDB) as a back-up or NAVAID of last resort. Even today in some remote areas beacons are still used for primary navigation. This is especially common in northern and western Canada and in Alaska. Anyone who flies into Canada without an ADF receiver has a navigational handicap. Some Canadian airports, especially those surrounded by high terrain, have two or even three NDB's to help VFR traffic avoid collisions with adjoining mountain slopes as well as for carrying out instrument approaches. Ruggedness of terrain and remoteness of some locations make the installation of VOR's for total coverage prohibitively expensive. (However, VOR's have been installed all along the Alaska Highway.) For routes where this coverage may not be so complete, U.S. pilots should make a point of practicing ADF tracking and NDB approaches before they cross the border.

Canadian Flight Rules

Air traffic and flight operation rules are basically the same in Canada as in the U.S., but there are some significant differences which many American pilots are unaware of or choose to ignore. These include:

1. Uncontrolled VFR flight "on top" (above an overcast) is not permitted.

2. A flight plan, flight notification, or flight itinerary is mandatory for operations over Canadian terrain.
3. For several years now, Canadian VFR flight levels have conformed to U.S. configurations: at or above 3,000 feet AGL; even thousands plus 500 feet for westerly headings; and odd thousands plus 500 feet for easterly headings. The same is true for IFR flight levels, odd or even thousand depending upon heading.
4. Regulations require registration of ultralight aircraft in order to fly in Canadian airspace. The only exception is through a waiver granted in writing by the Minister of Transport. Several stipulations must be met including those concerning survival equipment and prior permission for airport use.
5. Pilots must remember Canada uses ICAO standards to define its various types of airspace. Letters of the alphabet replace our words or abbreviations. All pilots should review Canadian airspace definitions before flying into say, Type A, B, C, or one of the other classes of airspace.

Survival Equipment

Specific equipment and rations are required in Canada for all flights within the area designated as "sparsely settled," which includes more than 90% of the country. The following are some of the required items, but check the Canadian *Aeronautical Information Publication* to make sure you have everything for the specific conditions:

10,000 calories of food per person
Sleeping bags
Pocket compass
Axe
Matches in a waterproof container
Cooking utensils
Jackknife or hunting knife
Mosquito netting and insect lotion
Fishing equipment
Snare wire
Stove and supply of fuel
Tents or engine or wing covers
Two pairs of snow shoes
Signalling mirror
Survival manual
Flexible saw blade
Flares or other signalling devices, such as conspicuity panels (wing or engine covers in aviation red or orange, silver survival blanket, etc.)

Photo by Fred Hirschmann

Far north pilots usually use wing and tail covers to keep lift-destroying snow and frost from accumulating, but these colorful covers, when displayed at an emergency landing site, can assist rescuers in finding downed airmen.

MAINTENANCE CONSIDERATIONS IN CANADA

In case you need maintenance or repairs in Canada on your way to Alaska, before you leave you should review FAR §43.17. Basically, a Transport Canada licensed "aircraft maintenance engineer" (AME) with the appropriate ratings or a person employed by a company with a Canadian-approved maintenance program may perform what the FAA terms "maintenance, preventive maintenance, or alterations" on U.S.-registered aircraft in Canada. This individual may also sign the aircraft logs appropriately. The Canadian AME can also return to service any U.S. aircraft that has not undergone a major repair or a major alteration. If this kind of repair or alteration is necessary while in Canada, the way in which it is to be performed must first be approved by the FAA, usually through telephone or facsimile coordination. Once the FAA approves the process, a Canadian authorized inspector may certify the return to service.

Certain preventive maintenance inspections can also be performed as long as the procedures conform to FAR Part 43 and the proper log entries are made. However, this applies only to a progressive or a 100-hour inspection, both of which may be accomplished by the AME. An annual inspection may only be performed on a U.S. aircraft by a U.S. mechanic with an inspection authorization.

Alaska survival requirements are similar except that food sufficient for two weeks per person is required plus a first aid kit and two signalling devices in sealed containers. You may or may not be asked about your survival gear when you file a flight plan, but the responsibility for having it on board is yours.

A Transport Canada fact sheet recommends that in addition to the required items the following "nice-to-have" items should also be carried: a spare axe handle, honing stone or file, ice chisel, snow knife or saw-knife, snow shovel, flashlight with spare bulbs and batteries, and a pack sack.

The fact sheet also recommends that pilots planning on flying into unfamiliar, sparsely settled areas discuss their plans with local police, pilots, or others familiar with the area before attempting the flight. Pilots can call aviation safety personnel at the following telephone numbers for advice on local flying conditions: Vancouver, BC (604) 666-9520; Seattle, WA (206) 431- 2738; Helena, MT (406) 449-5270; Anchorage, AK (907) 243-1902; Fairbanks, AK (907) 452-1276; Juneau, AK (907) 789-0231; and Edmonton, AB (403) 495-3861.

The rugged character of the mountains and the density of the forests have to be seen in order to appreciate the difficulties of search and rescue. Consequently, Canada also requires aircraft overflying its territory to have an operating ELT on board.

Summary

A review of some of the information provided by both Transport Canada and the FAA's Alaska Region point out several important areas that all pilots planning on flying to Canada or Alaska should review before leaving home. First every pilot should review their mountain flying skills, including operating from soft, rough, and short fields. Then each pilot should be very proficient in ADF procedures and VFR pilotage. Finally, everyone should review their knowledge of weather reporting and flight planning, Customs procedures, survival requirements, and the differences between Canadian and U.S. flight rules before they leave the Lower 48. It goes without saying that the aircraft to be flown needs to be completely checked and serviced. With advance planning and appropriate preparation anyone can have a safe and enjoyable trip. As a final reminder, every pilot should check with both U.S. and Canadian flight service officials for the latest flight and Customs requirements before leaving home.

RENDEZVOUS '92 SCHEDULE OF EVENTS

Rendezvous '92 events include activities sponsored by Canada, Alaska, and the International Joint Committee (IJC) coordinating the event. Some of the aviation related events sponsored by the IJC include:

Opening Ceremonies, Dawson Creek, BC, Feb. 16

Float Plane Rally and Competition

The Float Plane Rally and Competition will consist of up to four groups of about 15 float planes per group. The groups will fly from Dawson Creek, BC, to Fairbanks, AK. One group will depart Dawson Creek each day beginning June 21. For additional information on the Float Plane Rally and Competition contact the Alaskan Highway Float Plane Competition, Dawson Creek Municipal Airport, P.O. Box 150, Dawson Creek, BC V1G 4G4 CANADA; telephone (604) 782-3351; facsimile (604) 782-3352.

Airshows

The following sites in both Canada and the United States will host airshows:

Great Falls, MT	July 4
Edmonton, AB	TBA
Fort St. John, BC	July 19
Whitehorse, YT	July 26
Fairbanks, AK	TBA
Anchorage, AK	TBA

Airmada '92

Airmada '92 is a planned international airmada of aircraft including several War World II aircraft that will fly the Northwest Staging Route of 1942. The route was used to ferry aircraft under the Lend-Lease Program from the United States to the Soviet Union during World War II. Airmada '92 will depart Great Falls, MT on July 4 and is expected to arrive in Fairbanks, AK on July 12.

Air Tours

Air tours of the Alaska Highway are being planned by the Alberta Aviation Council. The council is planning on organizing up to three tours of the Highway during 1992. The groups may range in size from 30 to 50 aircraft. For additional information on the tours pilots can contact Mr. Ken Beleshko at (403) 451-5289 or by writing to the Alberta Aviation Council, 67 Airport Road, Edmonton, Alberta, Canada T5G 0W6.

For additional information on aviation events, contact Mr. Tom Reid, Director of Aviation, Alaska Highway Rendezvous '92 Society, 4740 Lisandra Road, Victoria, BC, Canada V9V 5B4; facsimile (604) 478-4144.

For complete information on Rendezvous '92 you can contact the Great Alaska Highway Society, P.O. Box 74250, Fairbanks, AK 99707; (907) 452-8000; Alaska Highway Rendezvous '92, Suite 14-9223, 100 St., Fort St. John, BC CANADA V1J 3X3; (604) 787-1992; or the Yukon Anniversaries Commission, Bag 1992, Whitehorse, YT CANADA, Y1A 5L9; (403) 668-1992.

ROUTE SELECTION

Once a pilot has gathered all the aeronautical information and aids available (sources as well as other necessary information are in the sidebars accompanying this article), the next important decision is the route to be followed to Alaska. Basically, from the lower 48 states there are two major air routes to get to Alaska—over predominantly land or over predominantly water. Each has its stirring scenery; each has its pitfalls for the unprepared. Landplanes or seaplanes can fly either, but you may find landplane pilots prefer the overland routings and seaplane pilots prefer the water route. In the remainder of this article, we will discuss the advantages and special considerations of both routes, and we will start our imaginary trip over land and talk about something called "Rendezvous '92."

Why Rendezvous '92?

Fifty years ago America was at war. Pearl Harbor had been bombed, and fears of a Japanese invasion of the West Coast were real. Although the Japanese never invaded the West Coast, they did invade parts of the then Alaska Territory. Small, but fierce, battles were fought between Allied forces and the Japanese in the ice and snow of the Aleutian Islands as the Japanese fought for a foothold in the North Pacific. Now 50 years later, 1992 has special meaning for a small group of Americans and Canadians who rushed to protect North America's frozen northern frontier during that time. This year they will celebrate the 50th anniversary of one of the greatest engineering feats of World War II—the building of the 1,500-mile Alaska Highway from Dawson Creek, British Columbia in Canada to Fairbanks, Alaska over some of the roughest terrain in the world. Canadians and Americans alike will celebrate the 50th anniversary of the highway's construction with a year-long series of events appropriately called "Alaska Highway Rendezvous '92." The celebration will feature formal opening and dedication ceremonies, reunions of civilian and military construction veterans, reenactment of historical events, and numerous special events along the length of the route.

"The Road," as it was called in 1942, was built to provide a fast means to move troops and supplies north to defend the region. Since then the road has served as the primary way for visitors from the "Lower 48" to travel to Alaska. It also serves as one of the best VFR navigation landmarks across Canada.

The highway itself is a lasting memorial to the cooperation between Canada and the United States. In 1942, Canada provided the right of way; waived import duties, sales taxes, and immigration regulations; and allowed the use of timber, gravel, and rock along the route. The United States paid for the construction and agreed to turn over the Canadian portion of the highway to Canada six months after the end of the war.

Using a design provided by the U.S. Army Corps of Engineers, seven Army engineer regiments built the road in less than nine months. Construction started in March of 1942, and the road's official dedication was held on November 20, 1942, at Soldiers' Summit above Kluane Lake, Yukon Territory, Canada. More than 11,000 troops built more than 8,000 culverts and 133 log and pontoon bridges as they worked on the single-lane road. Later more than 70 companies and 16,000 workers worked to improve the road during the period 1942 through 1949 when the road was opened for passenger traffic. Since then the road has been constantly upgraded, and this year marks the completion of the paving of the entire highway.

Overland—The Alaska Highway

Flying to Alaska over the highway is an exciting adventure filled with scenic beauty and endless outdoor recreational opportunities. The road not only provides an obvious landmark to follow, but one might say it is also "one of the world's longest runways" should the pilot encounter a problem over this forested and tundra landscape. (By the way, in Canada and Alaska, you will wound quite a few sensibilities if you call it the "Alcan Highway." It is, and always has been, "The Alaska Highway.")

This narrow, twisting ribbon of road is the inland lifeline that keeps most Alaska-bound pilots on course and provides them with an emergency landing area. Many sections have been widened and realigned to eliminate some confusing twists and turns. A great engineering feat and a great boon to VFR pilots, the Alaska Highway still is no Route 66. Roadside settlements are few and far apart.

Milepost Number One—Dawson Creek

The 1,500-mile long Alaska Highway was carved across the Rockies at an average elevation of about 2,500 feet above sea level (ASL). This intermountain "corridor" is walled for the most part by high mountains which may leave little room for maneuvering at low altitudes. Although Milepost Number One is at Dawson Creek, flight planning is better accomplished at Fort St. John, a short 47-mile hop away to the northwest and on the highway, where there is a flight service station and weather office for flight planning assistance and weather briefings.

For the 300-mile flight on to Fort Nelson from Fort St. John, the VFR pilot can either follow the highway or fly directly along the VOR airway (remembering that for VFR you must remain below 12,500 feet MSL—called ASL in Canada). En route, the terrain rises imperceptively. At midway the road elevation is considerably higher than at Fort St. John or Fort Nelson. Pilots have been trapped by low ceilings in this area, and some prefer to follow the nearby railroad, which permits flying at a lower altitude.

After Fort Nelson the highway begins its westward penetration of the Rockies, where it is soon overshadowed by mountain peaks of over 7,500 feet. There are both communications and navigation radio facilities along the remainder of the route (low frequency as well as VHF in Canada), but the VFR pilot who is flying within the corridor and below the airway will have inconsistent contact with VOR radio signals at best because of the terrain. Clouds tend to form along the peaks and frequently solidify into an overcast that may force the unwary VFR pilot into an unscheduled landing.

Fort Nelson and Watson Lake

The 300 mile stretch between Fort Nelson and Watson Lake, just inside the Yukon, is notorious for very abrupt changes in weather—from blue skies to complete overcast, from calm air to severe turbulence and windshear.

West of Fort Nelson about 30 miles before reaching Muncho Lake, the highway makes a right-angle turn. Many pilots have become lost after missing this turn and end up following an old mining road that parallels the highway and then swings south. At this turn some bush pilots prefer to fly north along the Fort Nelson River valley instead of following the Alaska Highway and then head west along the Liard River until it joins the road. The advantage is a lower flight altitude, plus less turbulence, but there are no landing fields en route. There are seaplane as well as landplane facilities at Watson Lake.

Yukon Border

After leaving Watson Lake the Alaska-bound pilot can follow the Alaska Highway as it weaves its way between 6,000-foot and 7,000-foot peaks along the British Columbia-Yukon border and then moves sharply northwest in the direction of Whitehorse (Milepost 919). Here adverse atmospheric and mineral conditions, as well as terrain obstacles, frequently interrupt radio signals for low-flying aircraft. Nevertheless, most pilots of light planes find that their greatest safety lies in flying low enough to keep the highway clearly in view, so that they

Photo by Fred Hirschmann

Denali, a mountain between Fairbanks and Anchorage in the Alaska Range, serves as a magnificent backdrop for a Cessna 185 on skis, a common winter landing gear in Canada and Alaska. Ground fog often obscures glacier landing sites on Denali, but Alaskan air taxis routinely land there and pass weather information on to others flying in the area.

avoid wandering off over old logging roads or apparent short cuts.

Leaving Whitehorse, pilots following the Alaska Highway must take care not to be misled by a northerly spur (to Braeburn in north-central Yukon) but, rather, should follow the Alaska Highway as it moves west to Burwash and on to Beaver Creek near the Alaskan border (Milepost 1315). An enormous glacier field hundreds of miles long and dominated by Mount Logan (19,850 feet), extends between the highway and the Pacific coast. To the northwest in the direction of Fairbanks, a broad river valley opens up, affording the pilot good VOR navigation for the remainder of the route.

Overland West—The Trench to the Highway

Alaska-bound pilots heading for the Alaska Highway and originating west of the Rockies usually follow one of the several river valleys that run parallel to the massive mountain ranges in British Columbia. The longest of these valleys, known as "The Rocky Mountain Trench," extends for about 450 miles from the vicinity of Cranbrook (near the U.S. border in Washington State) to Prince George. The highest ground elevation shown on charts is 4,000 feet MSL; the minimum recommended en route altitude is 5,000 feet MSL. Most of the route follows a highway, river, and railroad so that it is difficult to get lost. Good radio facilities (VHF and non-directional beacons) are located at either end. Commercial broadcast radio stations are at two midway points, Golden (CBXE 1240 and CKGR 1400) and Valemont (CBKI 1450).

There is one 100-mile segment in the Trench between Boat Encampment and Valemont where there is no highway or railroad below, only a narrow river winding its way through mountainous terrain. Weather is notoriously changeable here, and severe turbulence is possible at any point. Pilots of light aircraft should be constantly alert for rapidly lowering ceilings. There is a highway continuing from Valemont to Prince George.

From Prince George the preferred route is to follow the highway and railroad to Fort St. John and continue up the Alaska Highway. Pine Pass, midway between Prince George and Fort St. John, although not very high, is very windy. On occasion a combination of low altitude turbulence and very strong winds aloft can make this pass not so passable for light aircraft. At such times it may be necessary to detour around the mountains by following the Peace River westward to Hudson Hope and then following the northernmost segment of the Trench on up to Watson Lake and the Alaska Highway.

Prince George to Watson Lake

The northern segment of the Trench from Prince George to Watson Lake is a shortcut to the Alaska Highway that follows a clearly visible valley all the way. However, except for the first 100 miles between Prince George and Mackenzie, there is no highway. Between Mackenzie and Watson Lake, a distance of about 390 miles, there are no radio aids, no fuel, and only one good-sized airport—Ingenika, 100 miles up from Mackenzie on Williston Lake and operated primarily as a firefighting base. The only other airports are small or emergency airstrips that are not easy to spot from the air. Pilots intending to fly over this route are urged to stop at Prince George and get a carefully updated flight and weather briefing at the flight service station. Mackenzie has a good airport with ADF and UNICOM but no VOR. This route is recommended in good weather only—and in daylight hours. Storms materialize quickly, and snow is possible during any month of the year.

Smithers

From Prince George it is also possible to head west, following some 100 miles of highway to Smithers, and then fly north over Bell-Irving Pass and Kinaskan Lake to pick up the Alaska Highway. The pass is narrow, about 30 miles long, and reaches an elevation of 4,000 feet (minimum recommended en route altitude is 5,000 feet MSL). The adjoining mountains are over 10,000 feet, and the pass area is known for bad weather. Beyond the pass there are no airstrips before Kinaskan, except for one about 15 miles south of Kinaskan Lake, and no NAVAID's.

There are three airstrips along the 192 miles from Kinaskan Lake to Watson Lake; however, no low altitude radio or NAVAID's exist en route. If the weather is clear, an alternate route is to fly directly from Kinasken Lake to Whitehorse via Atlin, some 275 miles over very high terrain, with only one small airstrip en route at Telegraph Creek. Recommended en route altitude is 7,000 feet MSL. Again there are no radio or NAVAID installations along the route. There are numerous lakes suitable for seaplane use.

From Vancouver to the Highway

U.S. pilots bound for the Alaska Highway from the vicinity of Puget Sound can make their way north to Prince George over several recommended passages. The normal route for wheel-equipped VFR aircraft proceeds east from Vancouver along the Fraser River valley for 85 miles to Hope and then heads directly north by way of Clinton to Prince George, a distance of 445 miles.

This route follows Transport Canada airways, main highways, and rivers for the entire distance. VOR communications are good, and full facility airports are located at Abbotsford, Williams Lake, and Quesnel. There are private airstrips en route at Cache Creek, Clinton, Green Lake, 100 Mile House, and 108 Mile House, with several emergency strips in between. From Vancouver to Hope the suggested minimum altitude is 3,000 feet MSL, and from Hope to Cache Creek it is 5,000 feet MSL.

The latter segment is bordered by mountain ranges which separate moist coastal air from the normally dry air of the interior, making the area subject to rapid weather changes, sudden wind shifts, and extreme turbulence. Strong downflow conditions can be anticipated in the vicinity of Lytton, because of a funneling effect in the valley on very hot summer days.

This route should not be used in deteriorating weather or when the cloud cover is below 6,000 feet MSL, as the weather may change in minutes and close in to the surface. Several accidents have occurred under these conditins when pilots, instead of landing or turning back, attempted to detour through side canyons and were boxed in.

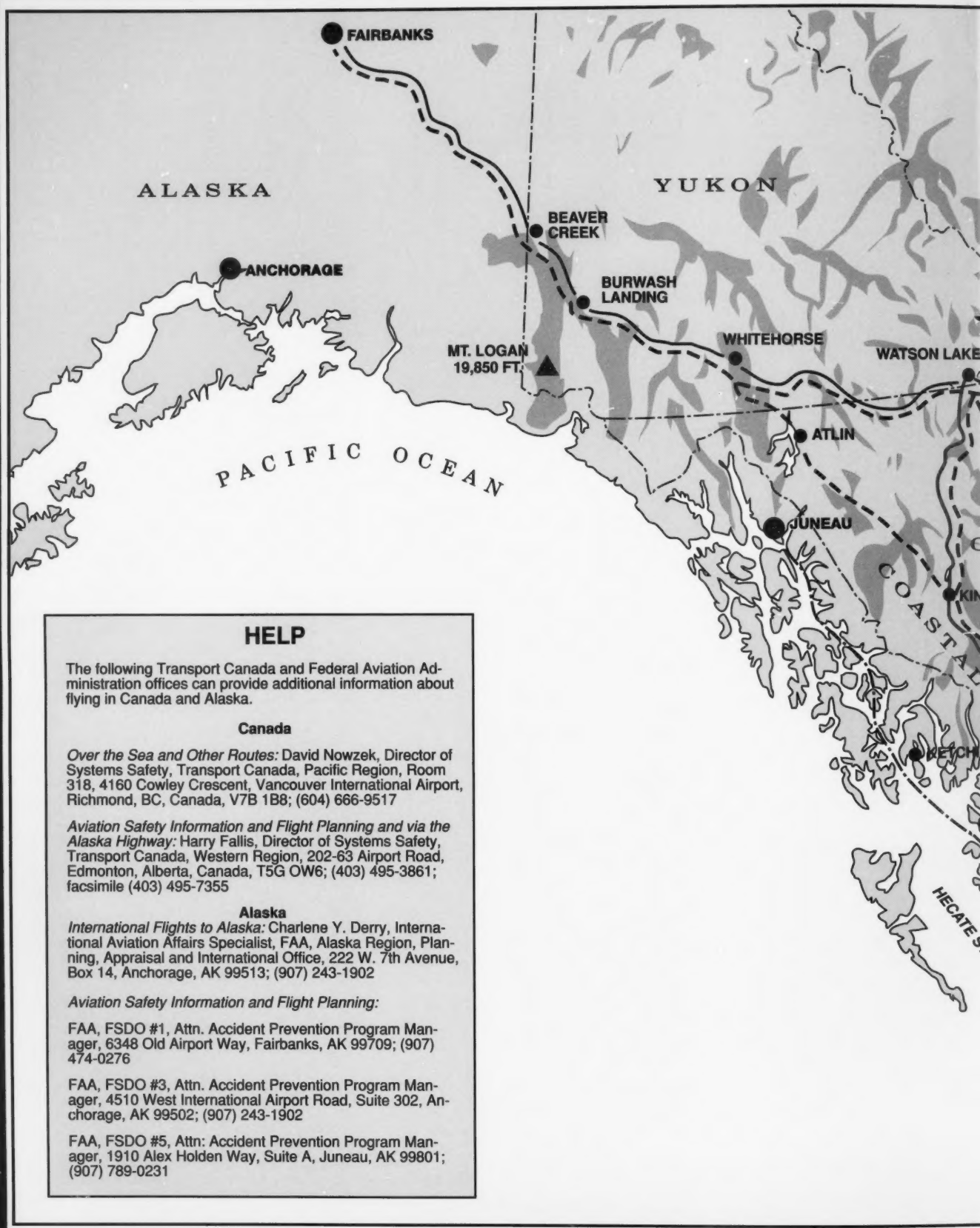
Cache Creek to Prince George

From Cache Creek to Prince George the route is over rolling country that forms the Central Interior Plateau. Below 5,000 feet MSL radio navigation can be tricky, because of terrain contours, mineral deposits, and atmospheric conditions. For the visiting pilot there are few recognizable landmarks. After Williams Lake navigation is easier as the route rejoins the Fraser River valley.

An alternate and somewhat shorter way of the central interior route is to fly west and north from Vancouver, BC by way of Squamish, Pemberton, D'Arcy, and Clinton, and then continue to Prince George along the Fraser valley. This route is more suitable for float-equipped aircraft, as there are more water landing sites available than land strips. VHF communications are not effective here below 8,000 feet MSL, and there are no navigational aids available at lower altitudes. There is no road between D'Arcy and Clinton. The highest point along the route (Alta Lake, between Squamish and Pemberton) is usually the bottleneck in adverse weather. Some of the mountains in this area are permanently snowcapped.

Radio Service on the Highway

The major points along the Canadian segment of the Alaska Highway have VOR's as well as NDB's, but their reception depends upon the altitude of the aircraft and the atmospheric conditions. Radio-equipped airports are located at Whitehorse, Fort Nelson,



HELP

The following Transport Canada and Federal Aviation Administration offices can provide additional information about flying in Canada and Alaska.

Canada

Over the Sea and Other Routes: David Nowzek, Director of Systems Safety, Transport Canada, Pacific Region, Room 318, 4160 Cowley Crescent, Vancouver International Airport, Richmond, BC, Canada, V7B 1B8; (604) 666-9517

Aviation Safety Information and Flight Planning and via the Alaska Highway: Harry Fallis, Director of Systems Safety, Transport Canada, Western Region, 202-63 Airport Road, Edmonton, Alberta, Canada, T5G OW6; (403) 495-3861; facsimile (403) 495-7355

Alaska

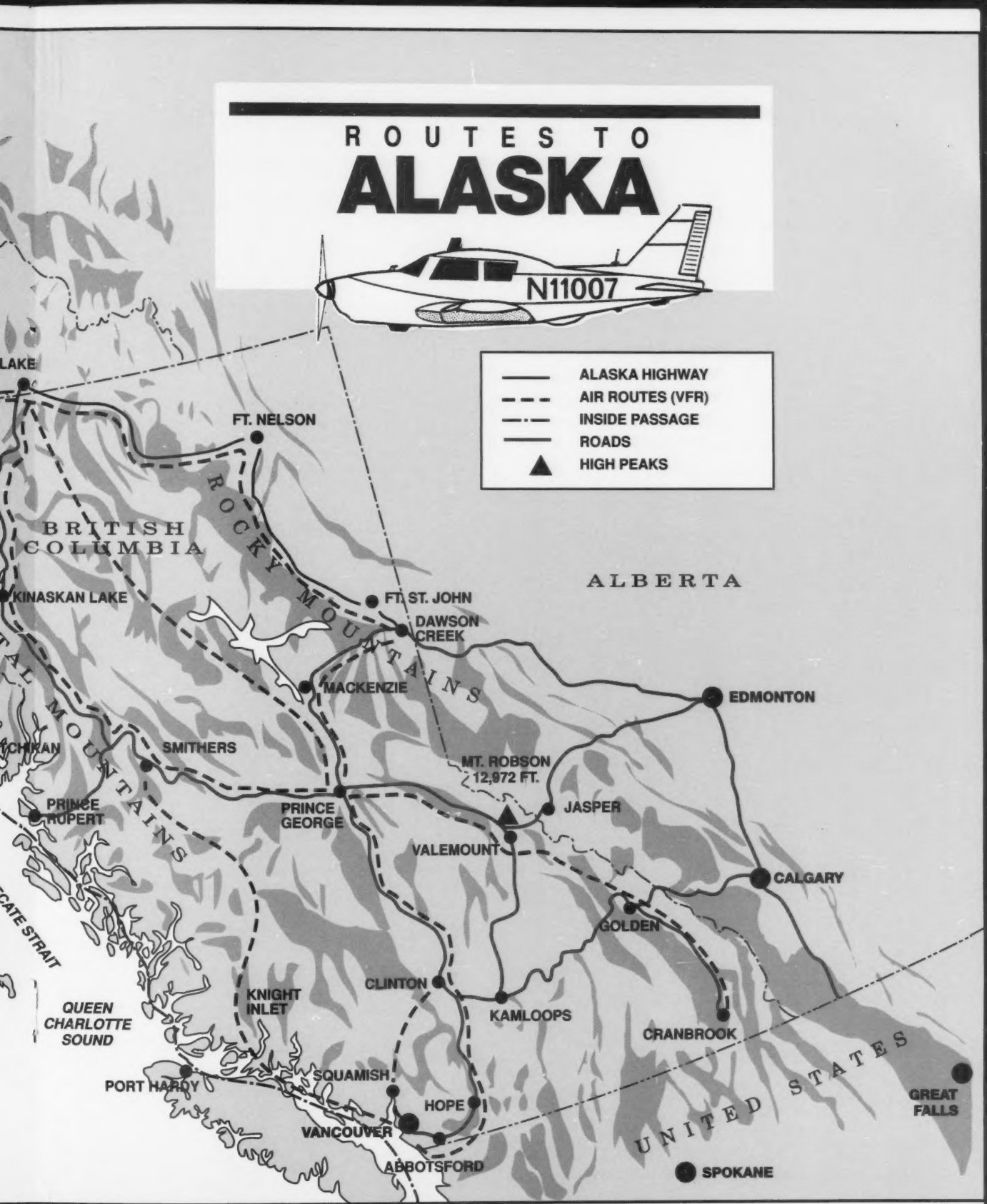
International Flights to Alaska: Charlene Y. Derry, International Aviation Affairs Specialist, FAA, Alaska Region, Planning, Appraisal and International Office, 222 W. 7th Avenue, Box 14, Anchorage, AK 99513; (907) 243-1902

Aviation Safety Information and Flight Planning:

FAA, FSDO #1, Attn. Accident Prevention Program Manager, 6348 Old Airport Way, Fairbanks, AK 99709; (907) 474-0276

FAA, FSDO #3, Attn. Accident Prevention Program Manager, 4510 West International Airport Road, Suite 302, Anchorage, AK 99502; (907) 243-1902

FAA, FSDO #5, Attn: Accident Prevention Program Manager, 1910 Alex Holden Way, Suite A, Juneau, AK 99801; (907) 789-0231


ROUTES TO
ALASKA
N11007
ALASKA HIGHWAY
AIR ROUTES (VFR)
INSIDE PASSAGE
ROADS
HIGH PEAKS
LAKE
FT. NELSON
BRITISH COLUMBIA
ROCKY MOUNTAINS
ALBERTA
KINASKAN LAKE
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MACKENZIE
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PRINCE RUPERT
PRINCE GEORGE
JASPER
VALEMOUNT
CALGARY
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QUEEN CHARLOTTE SOUND
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CLINTON
KAMLOOPS
CRANBROOK
PORT HARDY
SQUAMISH
HOPE
VANCOUVER
ABBOTSFORD
UNITED STATES
GREAT FALLS
SPOKANE

Dawson Creek, and Fort St. John, supported by flight service stations offering flight assistance and weather information.

While in Canadian airspace flight service stations may be contacted in flight as altitude conditions permit on frequency 126.7; current weather or terminal forecasts are provided. As in the United States, 122.8 and 123.0 are the usual UNICOM frequencies. Private UNICOM operators also use 123.3 through 123.5. In Canada, where no ground station exists or no mandatory frequency is established, 126.7 should be used for advisory purposes.

CUSTOMS PROCEDURES

Canadian Customs procedures, outlined in the *Canadian Flight Supplement*, require pilots entering Canada to have filed a flight plan and to land at a Canadian Customs Authorized Airport of Entry. Customs must be notified in enough time to enable an agent to meet the aircraft upon landing. At least one hour is normally required. Pilots should telephone Customs before the point of intended landing to confirm notification.

Customs officers are normally on duty at airports of entry from 9:00 a.m. to 5:00 p.m. daily. Pilots are advised to check on the current duty schedule at their airport of entry, especially at the smaller airports because there is some local variance in the work schedule. A few offices are closed on certain weekdays, and some operate on a 24-hour basis. Telephoned requests for Customs services at off-duty hours must be received during normal work periods. If no Customs official is available when you arrive you may not be allowed to continue until one is available. If an officer comes during off-duty times, you will have to pay a fee for the service. Canada segregates some of its airports by general aviation, commercial, or air carrier Customs. Note this before your arrival.

One FAA inspector provided this tip on how pilots should arrange the required Customs inspections when crossing a border. They should use a telephone credit card or some other means of billing that provides proof the required notification call was made. Then if there is a problem with the notification, they have proof they called. They should not use coins at a pay telephone. The coins do not provide an alibi in case of an investigation. Although pilots should call Customs direct, they can use the ADCUS (advise Customs) procedures outlined in the FAA's International Flight Information Manual.

U.S. Customs procedures also require a flight plan. The flight plan must include the number of U.S. citizens and aliens on board the aircraft in addition to the normal flight plan information. U.S. Customs also require advance notice of arrival. Pilots should check the AIM and IFIM for additional information on international flight plans. Pilots are reminded that they must pay an annual $25 Customs aircraft processing fee for private aircraft returning to the U.S. The fee is payable once every calendar year either upon first entry into the U.S. or it can be paid in advance. The provided decal must then be visible on the aircraft to show proof of payment. The fee receipt should be kept in the aircraft as proof of compliance. Also remember that so-called "pink slip" registrations are not acceptable proof of ownership for international flights. New Customs regulations also require that pilots returning to the U.S. present their pilot and medical certificates and valid certificate of registration for their aircraft to Customs upon demand. Failure to do so can subject the pilot to penalty. Furthermore, if you have had extra fuel tanks added, such as cockpit fuel tanks, make sure you have the appropriate notations in the aircraft logs and/or FAA Form 337 (Major Repair and Alteration) to prove that it is an acceptable modification.

The flight service station is an invaluable source of information about local flying conditions, and a personal visit is recommended. Updates of radio equipment outages, fuel availability, terrain or runway damage, and all manner of local flying lore can be imparted to the visiting pilot.

Over Water—The Inside Passage

The shortest flight from the Seattle area to southern Alaska is directly up the Pacific Coast of British Columbia, about 700 statute miles from Seattle to Ketchikan on the lower end of the Alaska "panhandle." The state capital of Juneau is another 250 miles further up the coast. There are generally no problems for well-planned IFR operations because of the low and high frequency airways, numerous NAVAID's, and good radar coverage.

For general aviation aircraft operating VFR, most experienced pilots agree that this route is best flown in a seaplane piloted by airmen experienced in visual reference and having some knowledge of the area. They suggest that for your first trip you fly with a pilot already familiar with the route. The jagged, mountainous coast line with its innumerable islets, inlets, and fiords is one of the easiest places in the world to get lost. It is a marvel of nature worth contemplating in fair weather, but it is a different story when the sea fog rolls in and obscures visibility—as it does much of the time. Two to three U.S.-registered aircraft crash in transit along the British Columbia coast every year, with a high percentage of fatalities. Difficulties in maintaining accurate position fixes by visual reference is a common failing.

Seattle to Port Hardy

The 950-mile Seattle to Juneau trip can be made in three legs of about 300 miles each. The first long leg from the Seattle area up to Vancouver, BC and on through the coastal straits between the mainland and Vancouver Island is well-served by NAVAID's, both VOR's and NDB's. There are several airways extending up to the Port Hardy VOR at the north end of Vancouver Island. Pilotage is supported by prominent checkpoints which can be verified by the NAVAID's. Full service airports and seaplane bases offer ample starting points from the U.S./Canada border at Puget Sound and ongoing support along the first leg of the route.

Flying conditions are not too bad in the straits to the lee of massive Vancouver Island. The vast Queen Charlotte Sound to the north is a different matter. Sea fog is the most notorious deterrent to VFR flight, but seaplane pilots will often have high winds to contend with and heavy seas to negotiate if they have to put down outside of a seaplane base or a sheltered cove.

Port Hardy, at the entrance to the Sound, is a frequent stopover for transitting pilots; however, it is not a port of entry, so stopping there first would not satisfy Customs requirements. There are landplane and seaplane facilities and plenty of lodging nearby. Even though the flight from Seattle may have taken only three or four hours, pilots often overnight in Port Hardy and cross the Sound early the following morning when the weather is more temperate and when the pilots themselves are well-rested. This next leg of the journey is the biggest challenge to general aviation pilot skills.

Port Hardy to Prince Rupert

For the approximately 280 miles from Port Hardy to Prince Rupert, there is only one landplane airport (Bella Bella, 100 miles northwest of Port Hardy) and one seaplane base (Ocean Falls in Fisher Channel, 100 miles north of Port Hardy.) However, Ocean Falls has no fuel or docking facilities and the Canadians consider it a poor stop for transients. Bella Bella has three seaplane facilities, but seaplane pilots should check with the locals at Port Hardy and refer to the *Water Aerodrome Supplement* for full information. A half dozen or so limited service seaplane bases are scattered along the coastline. ("Limited service" means fuel, maintenance, and mooring facilities are not always available.)

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Photo by Fred Hirschmann

Alaska's southeast panhandle on the way to Juneau provides spectacular though formidable scenery. A floatplane may be the best choice for an "Inside Passage" trip.

Weather is the major cause of trouble for pilots along this portion of the route. Clouds can extend from nearly sea level to altitudes well above the performance ceiling of many general aviation airplanes. Veteran flyers of this route say the only way to fly VFR—if you have to fly VFR—is under the weather rather than trying to top it out.

There are actually two routes pilots could use for this leg—one using airways (an almost straight-line shot between Port Hardy and Prince Rupert) and one crisscrossing the British Columbia coastline between seaplane bases. The latter route is ideal for pilots who do not wish to fly over water unless they can maintain a safe gliding distance to shore. Zigzagging increases the distance and the fuel burned but offers the best opportunities for successful pilotage and for locating the few facilities there are along the way.

Victor 317 and low frequency airway Amber 15 out of the Port Hardy VOR and NDB are direct routes north to Prince Rupert. However, they lie over the deep waters of Queen Charlotte Sound and Hecate Strait for most of the route. For the first half of this overwater route, seaplane facilities and the solitary land airport (Bella Bella) lie 20 to 45 miles to the east—certainly not within gliding distance at low altitude. The nearest facilities to the west of the route are on Queen Charlotte Island, 150 miles away over open water. Check the facilities available ahead before taking off from Port Hardy. The local FSS will have current information.

Prince Rupert to Juneau

Approximately 90 miles northwest of Prince Rupert lies Ketchikan on the rainy, rugged southern tip of the Alaska panhandle. This portion of the route is likely to be plagued with low clouds and continuous rain the whole way. Without IFR capability you may have to sit it out on the ground (or water). Flying through the showers you may find the duration and intensity of the rain fierce and fatiguing. Petersburg, AK, an island town some 100 miles northwest of Ketchikan, averages 12 feet (that is 144 inches) of rain a year. Locals ignore it, but visiting pilots have described the downpour as sounding like "one long thunderclap."

You can lay over at Annette Island, about 25 miles southeast of Ketchikan, but the airport is privately owned and requires prior notice for landing. There are several good seaplane bases. Ketchikan has a large international airport and seaplane base, as well as a flight service station.

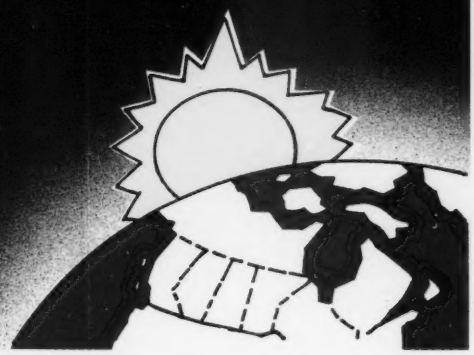
Pilotage becomes a little tricky for low-flying pilots now. This is because magnetic disturbances in some areas are as great as 50° at sea level and make the magnetic compass unreliable. Out of Ketchikan you can fly up Clarence Strait to the Level Island VOR, 100 miles north. About a half dozen seaplane bases lie on either side of the strait, the farthest being about 35 miles inland. There are no land airports until you fly north of Level Island, and they are about 30 miles off the course.

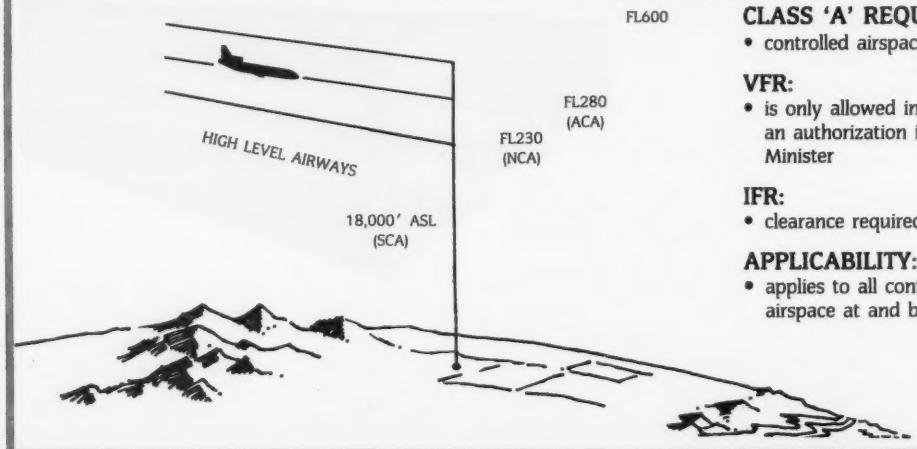
Juneau is now just 135 miles away as the crow flies. With good visual references, you could fly around Kupreanof Island, cross Frederick Sound, and then shoot up Chatham Strait to Juneau. There are no airports en route, but several limited service seaplane bases.

An alternative is to fly northeast from Level Island to Petersburg, a good stopping place since it has the last full service seaplane base and land airport until Juneau. From Petersburg, Juneau lies across Frederick Sound and up Stephens Passage. There are two limited service seaplane facilities on the east coast of the passage

Canada's Airspace

Information for Pilots on the Airspace Classification and Structures



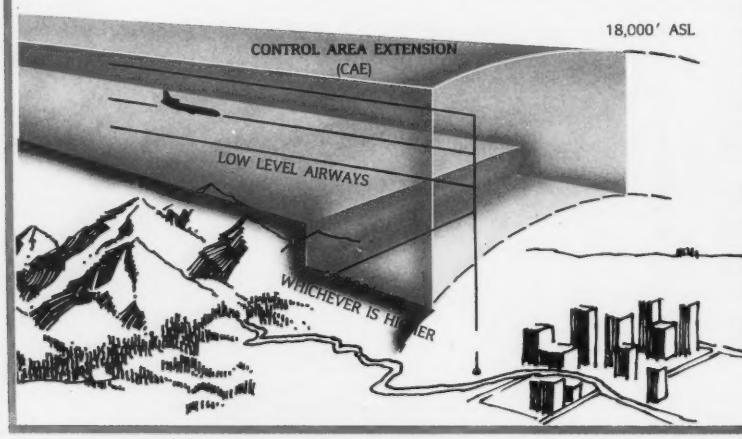


CLASS 'A' REQUIREMENTS:
- controlled airspace

VFR:
- is only allowed in accordance with an authorization issued by the Minister

IFR:
- clearance required from ATC

APPLICABILITY:
- applies to all controlled high level airspace at and below FL600



CLASS 'B' REQUIREMENTS:
- controlled airspace
- 2-way radio
- appropriate navigation equipment
- BLOCK AIRSPACE ENDORSEMENT no longer required

VFR:
- clearance required from ATC

IFR:
- clearance required from ATC

APPLICABILITY:
- applies to all controlled low level airspace above 12,500' ASL or the MEA, whichever is the higher

INTRODUCTION:

This information has been produced by the Aviation Group to provide a better understanding of the airspace classification that became effective May 10, 1984. For the precise wording, please refer to ANO Series V, No. 23 and additional information in the A.I.P. CANADA (TP2300). Details of the airspace structure and classification are in the Designated Airspace Handbook, TP1820E (DAH).

STRUCTURE:

The airspace structure defines the physical dimensions of the elements into which the airspace is divided, such as CZ, ATZ, TCA, airways and control area extensions.

CLASSIFICATIONS:

Canadian Domestic Airspace is given one of six airspace classifications: A, B, C, D, E or F.

FORTHCOMING CHANGES:

- the base of controlled airspace will be raised from 700′ AGL to 2,200′ AGL.
- the establishment of transition areas in select areas.
- watch A.I.P. CANADA and its supplements for those changes.

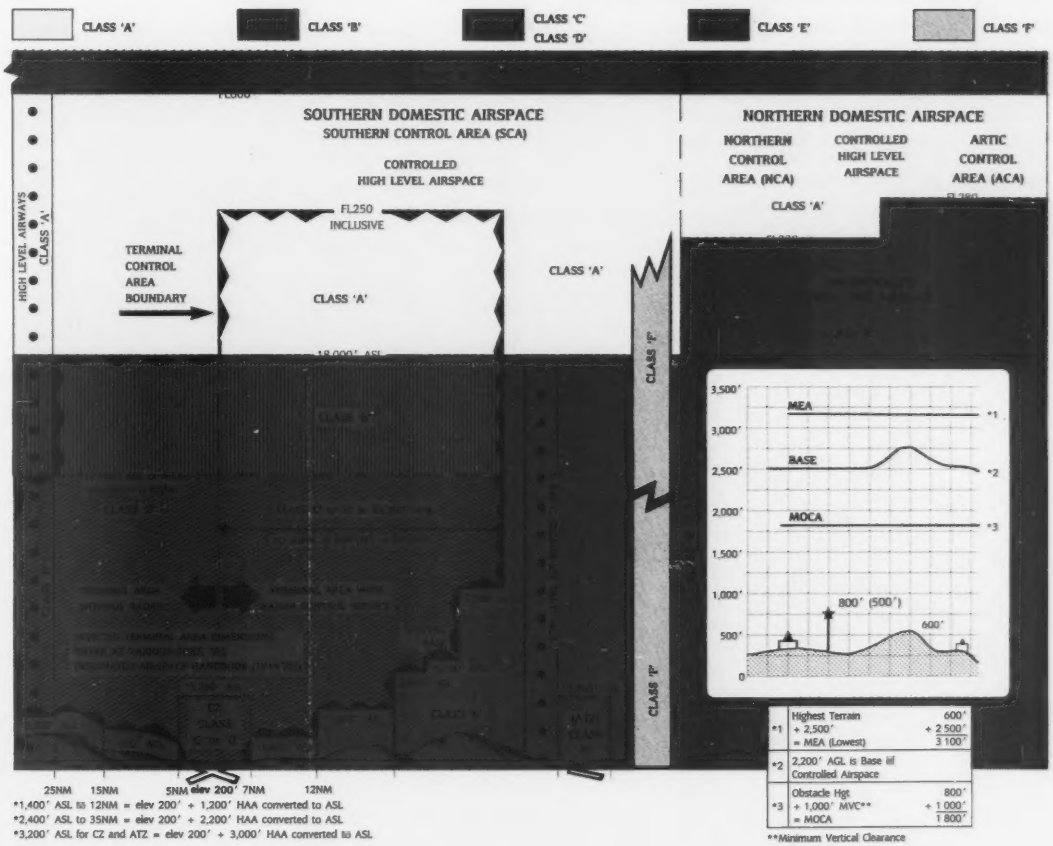
SPECIAL FEATURES:

CLASS 'A' AIRSPACE:

- controlled airspace
- IFR only

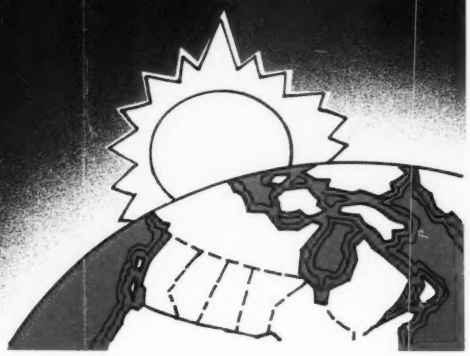
CLASS 'F' AIRSPACE:

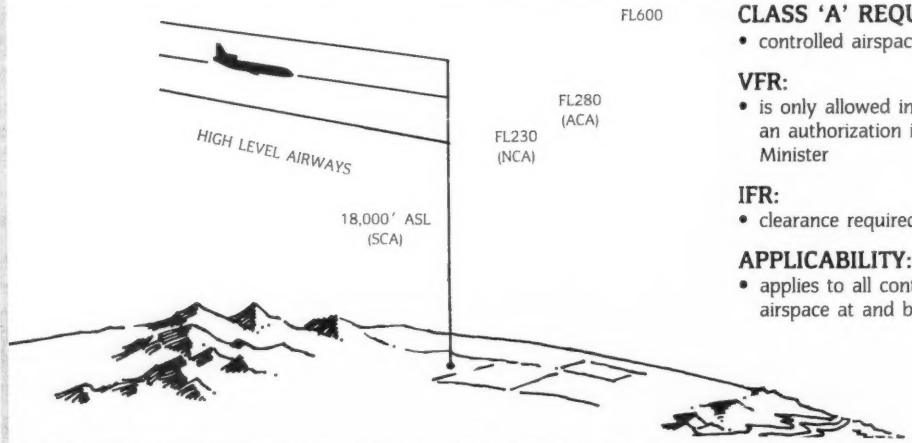
- special use airspace



Canada's Airspace

Information for Pilots on the Airspace Classification and Structures



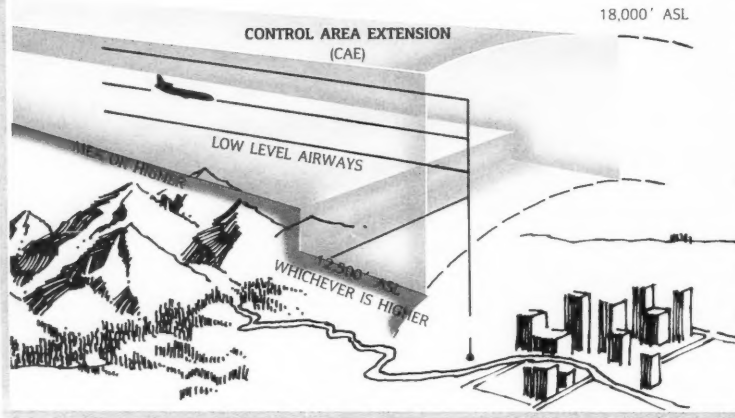


CLASS 'A' REQUIREMENTS:
- controlled airspace

VFR:
- is only allowed in accordance with an authorization issued by the Minister

IFR:
- clearance required from ATC

APPLICABILITY:
- applies to all controlled high level airspace at and below FL600



CLASS 'B' REQUIREMENTS:
- controlled airspace
- 2-way radio
- appropriate navigation equipment
- BLOCK AIRSPACE ENDORSEMENT no longer required

VFR:
- clearance required from ATC

IFR:
- clearance required from ATC

APPLICABILITY:
- applies to all controlled low level airspace above 12,500' ASL or the MEA, whichever is the higher

INTRODUCTION:

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- the establishment of transition areas in select areas.
- watch A.I.P. CANADA and its supplements for those changes.

SPECIAL FEATURES:

CLASS 'A' AIRSPACE:
- controlled airspace
- IFR only

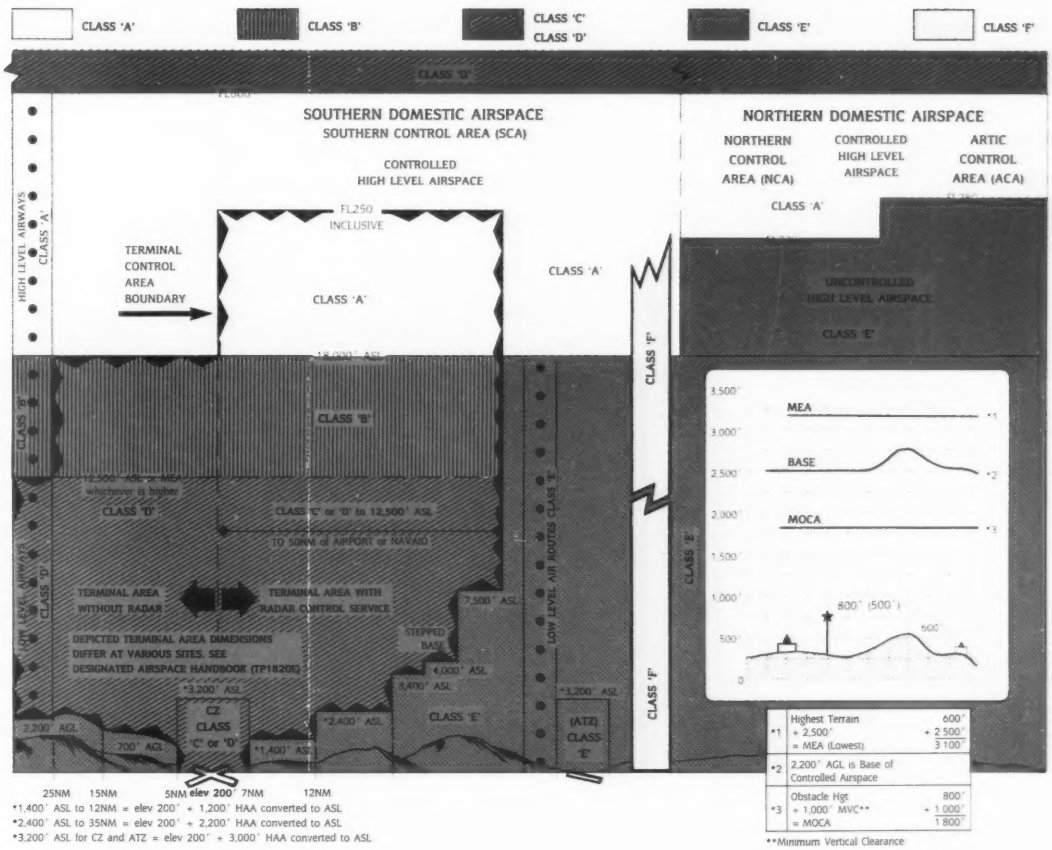
CLASS 'B' AIRSPACE:
- controlled airspace
- only IFR and controlled VFR flights are permitted

CLASS 'C' AIRSPACE:
- controlled airspace
- IFR and VFR flights are permitted
- VFR flights require a clearance from ATC to enter

CLASS 'D' AIRSPACE:
- controlled airspace within which both IFR and VFR flights are permitted
- VFR flights do not require a clearance to enter

CLASS 'E' AIRSPACE:
- uncontrolled airspace

CLASS 'F' AIRSPACE:
- special use airspace

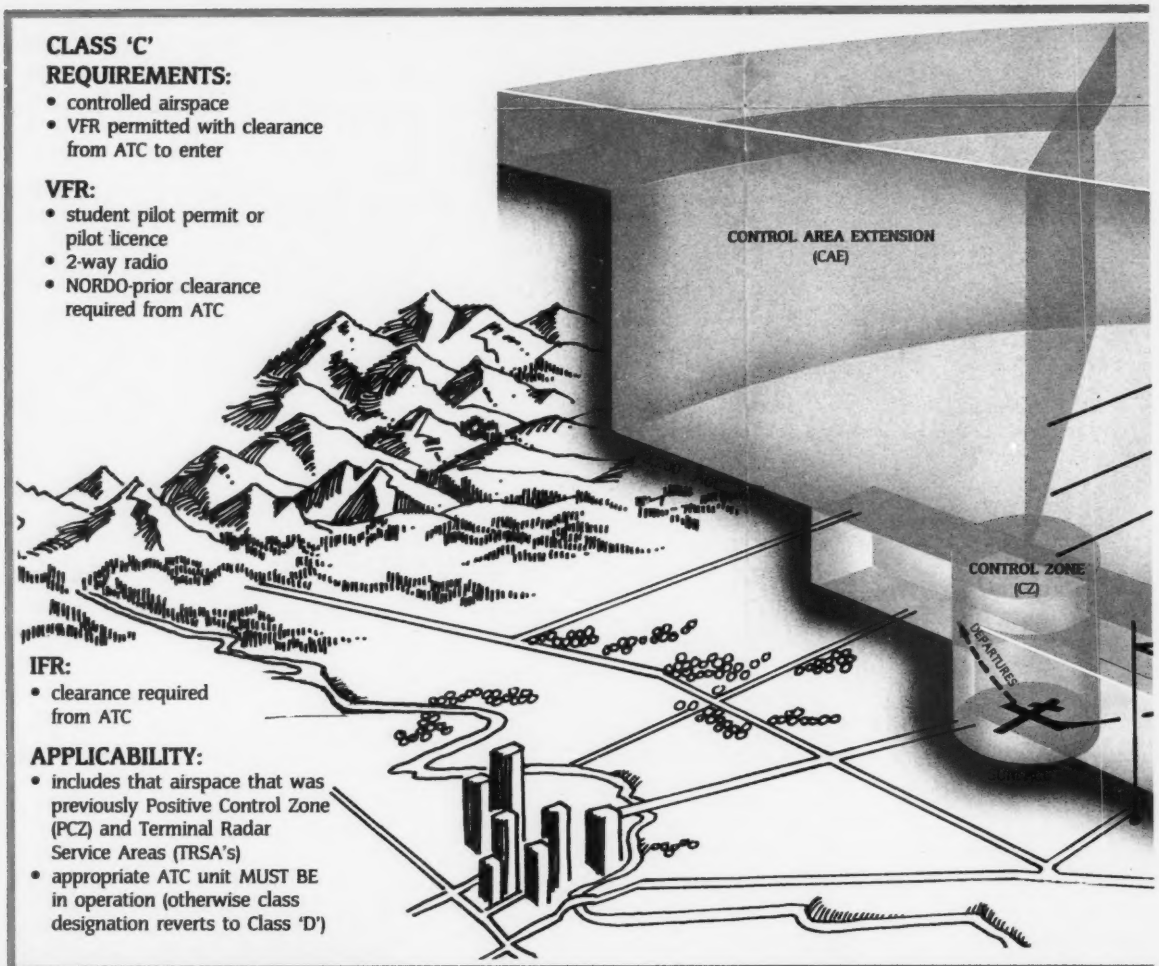

CLASS 'A'
CLASS 'B'
CLASS 'C'
CLASS 'D'
CLASS 'E'
CLASS 'F'
SOUTHERN DOMESTIC AIRSPACE
SOUTHERN CONTROL AREA (SCA)
CONTROLLED HIGH LEVEL AIRSPACE
NORTHERN DOMESTIC AIRSPACE
NORTHERN CONTROL AREA (NCA)
CONTROLLED HIGH LEVEL AIRSPACE
ARTIC CONTROL AREA (ACA)
FL250 INCLUSIVE
TERMINAL CONTROL AREA BOUNDARY
HIGH LEVEL AIRWAYS CLASS 'A'
LOW LEVEL AIRWAYS CLASS 'D'
LOW LEVEL AIR ROUTES CLASS 'E'
UNCONTROLLED HIGH LEVEL AIRSPACE
TERMINAL AREA WITHOUT RADAR
TERMINAL AREA WITH RADAR CONTROL SERVICE
DEPICTED TERMINAL AREA DIMENSIONS DIFFER AT VARIOUS SITES. SEE DESIGNATED AIRSPACE HANDBOOK (TP1820E)
TO 50NM of AIRPORT or NAVAID
STEPPED BASE
CZ CLASS 'C' or 'D'
(ATZ) CLASS 'E'
MEA
BASE
MOCA
800′ (500′)
600′
25NM 15NM 5NM elev 200′ 7NM 12NM
*1,400′ ASL to 12NM = elev 200′ + 1,200′ HAA converted to ASL
*2,400′ ASL to 35NM = elev 200′ + 2,200′ HAA converted to ASL
*3,200′ ASL for CZ and ATZ = elev 200′ + 3,000′ HAA converted to ASL
*1 Highest Terrain 600′ + 2,500′ = MEA (Lowest) 3,100′
*2 2,200′ AGL is Base of Controlled Airspace
*3 Obstacle Hgt 800′ + 1,000′ MVC** = MOCA 1,800′
**Minimum Vertical Clearance

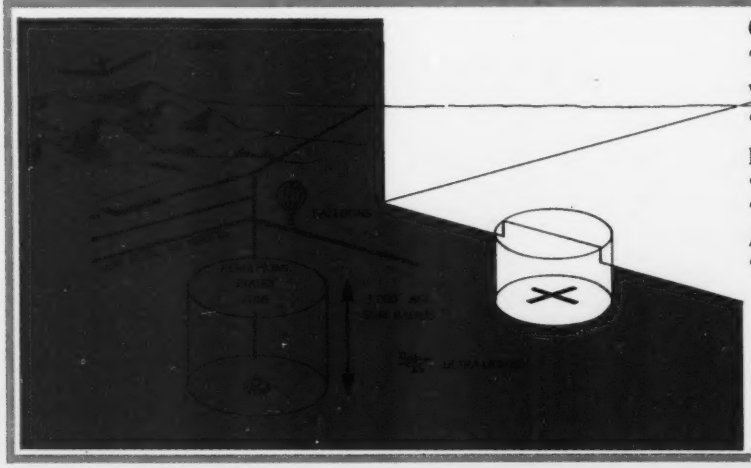
CLASS 'C'
REQUIREMENTS:
- controlled airspace
- VFR permitted with clearance from ATC to enter

VFR:
- student pilot permit or pilot licence
- 2-way radio
- NORDO-prior clearance required from ATC

IFR:
- clearance required from ATC

APPLICABILITY:
- includes that airspace that was previously Positive Control Zone (PCZ) and Terminal Radar Service Areas (TRSA's)
- appropriate ATC unit MUST BE in operation (otherwise class designation reverts to Class 'D')





CLASS 'E' REQUIREMENTS:
- uncontrolled airspace

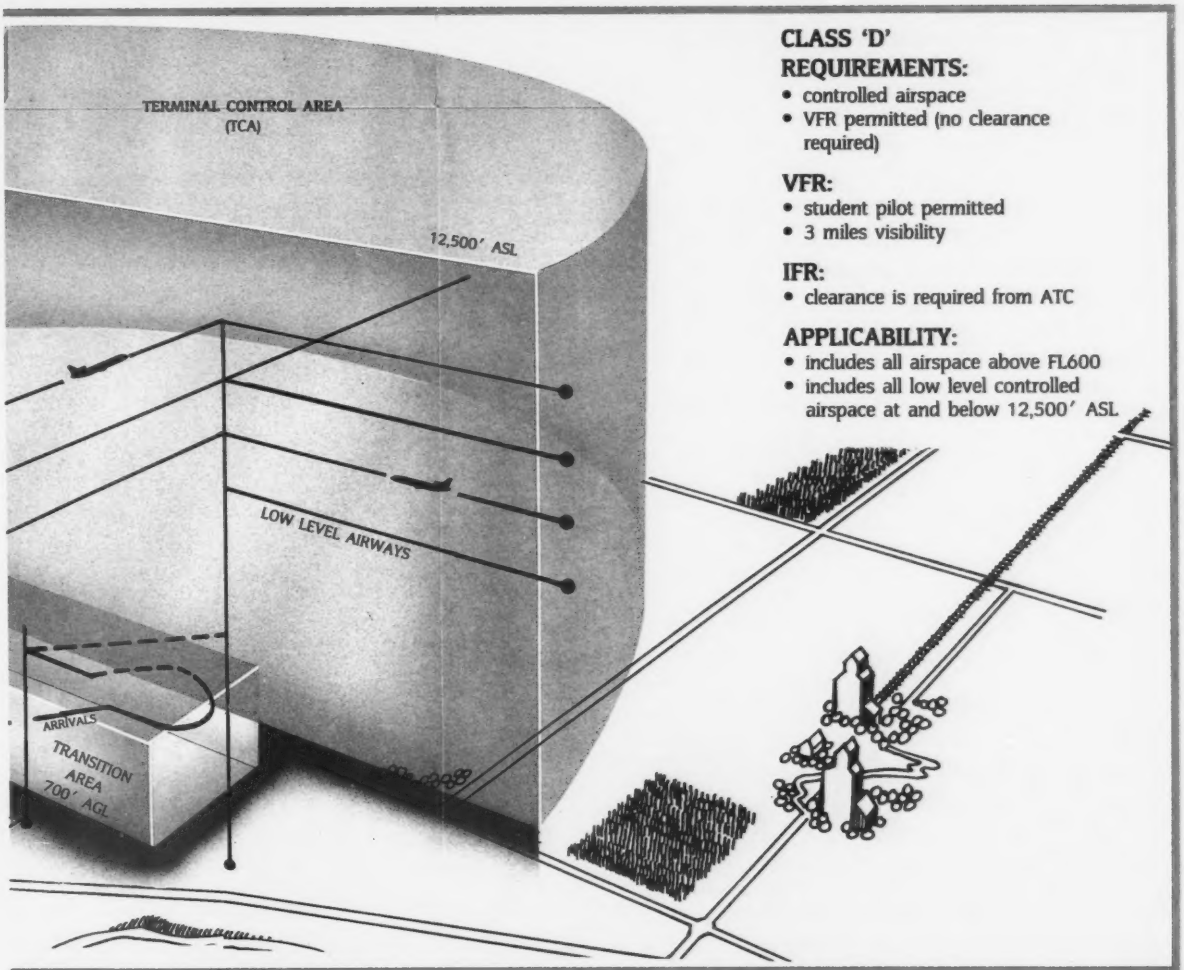
VFR:
- not controlled

IFR:
- not controlled
- instrument rating required

APPLICABILITY:
- consists of ALL airspace not designated as Class A, B, C or D

Transport Canada Aviation

Transports Canada Aviation



CLASS 'D'
REQUIREMENTS:
- controlled airspace
- VFR permitted (no clearance required)

VFR:
- student pilot permitted
- 3 miles visibility

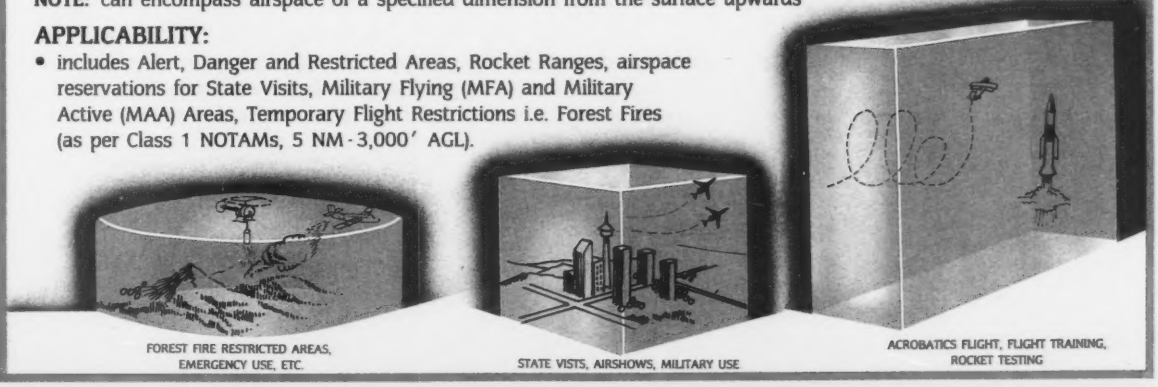
IFR:
- clearance is required from ATC

APPLICABILITY:
- includes all airspace above FL600
- includes all low level controlled airspace at and below 12,500′ ASL

CLASS 'F' REQUIREMENTS:
- generally uncontrolled unless specified by NOTAM, ATC or the Minister

NOTE: can encompass airspace of a specified dimension from the surface upwards

APPLICABILITY:
- includes Alert, Danger and Restricted Areas, Rocket Ranges, airspace reservations for State Visits, Military Flying (MFA) and Military Active (MAA) Areas, Temporary Flight Restrictions i.e. Forest Fires (as per Class 1 NOTAMs, 5 NM - 3,000′ AGL).



FOREST FIRE RESTRICTED AREAS, EMERGENCY USE, ETC.

STATE VISTS, AIRSHOWS, MILITARY USE

ACROBATICS FLIGHT, FLIGHT TRAINING, ROCKET TESTING

Canada

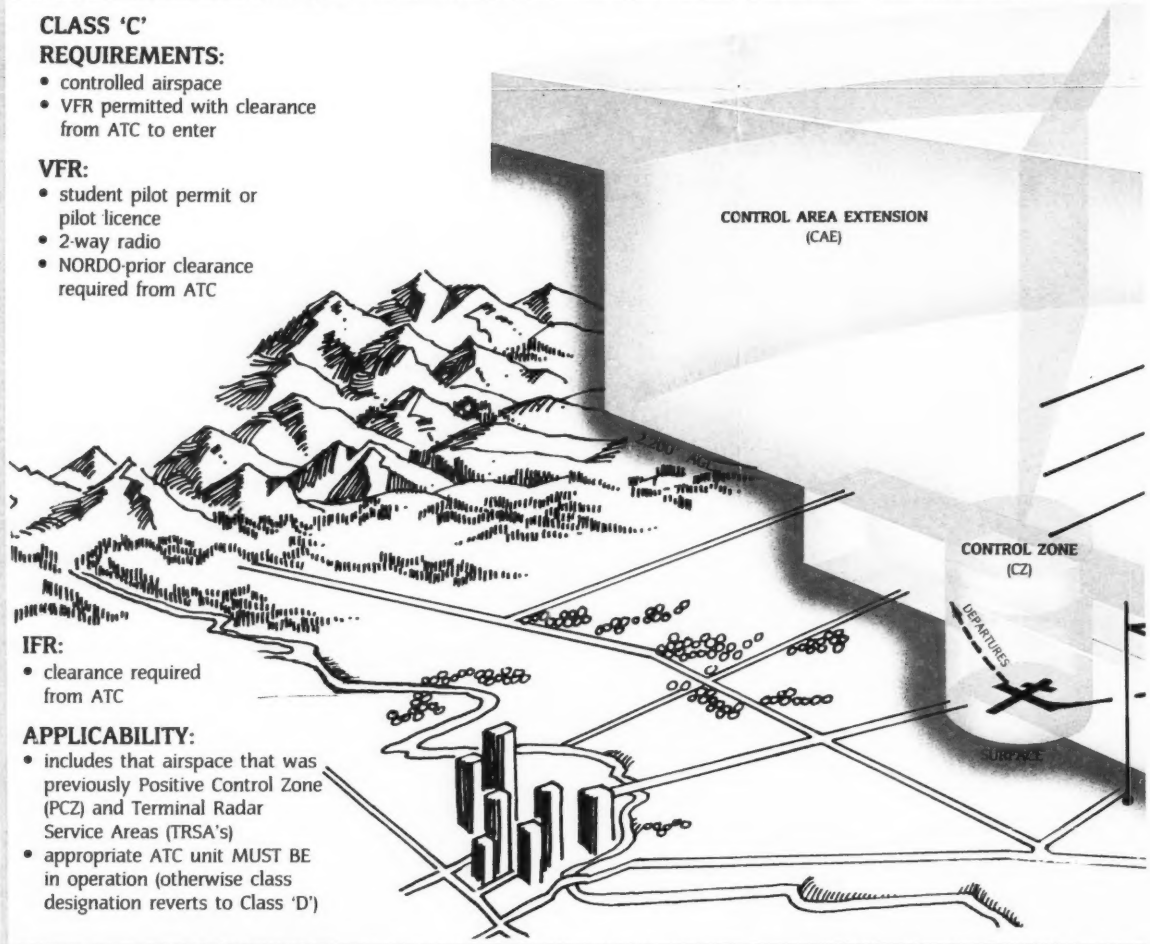
TP 6010

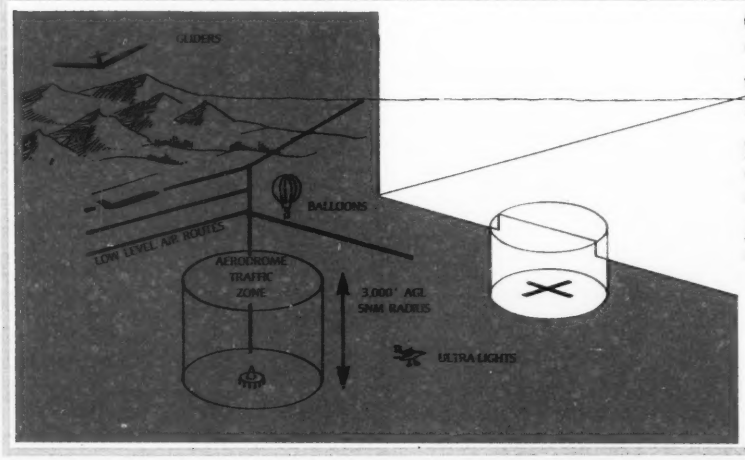
CLASS 'C'
REQUIREMENTS:
- controlled airspace
- VFR permitted with clearance from ATC to enter

VFR:
- student pilot permit or pilot licence
- 2-way radio
- NORDO-prior clearance required from ATC

IFR:
- clearance required from ATC

APPLICABILITY:
- includes that airspace that was previously Positive Control Zone (PCZ) and Terminal Radar Service Areas (TRSA's)
- appropriate ATC unit MUST BE in operation (otherwise class designation reverts to Class 'D')





CLASS 'E' REQUIREMENTS:
- uncontrolled airspace

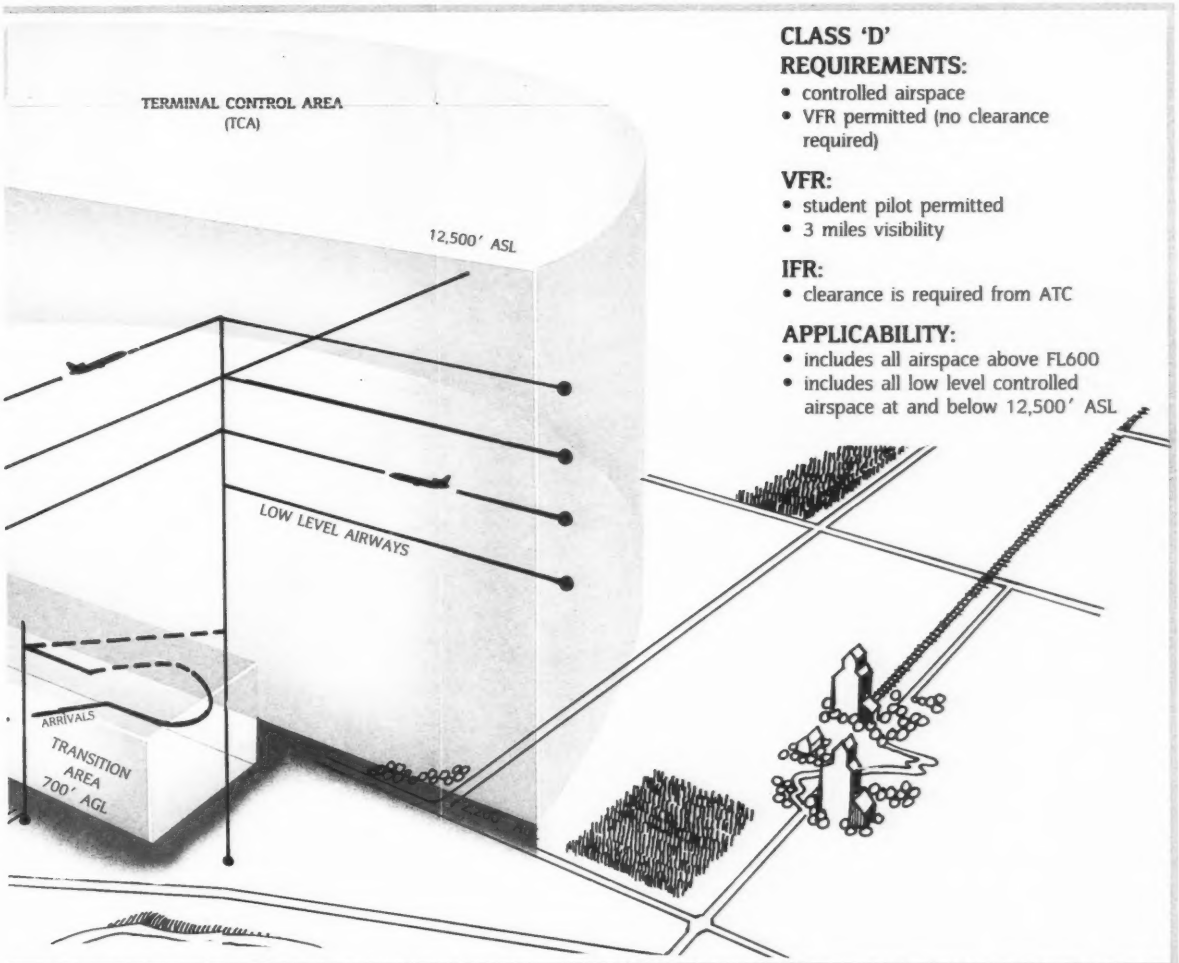
VFR:
- not controlled

IFR:
- not controlled
- instrument rating required

APPLICABILITY:
- consists of ALL airspace not designated as Class A, B, C or D

Transport Canada Aviation

Transports Canada Aviation



CLASS 'D'
REQUIREMENTS:
- controlled airspace
- VFR permitted (no clearance required)

VFR:
- student pilot permitted
- 3 miles visibility

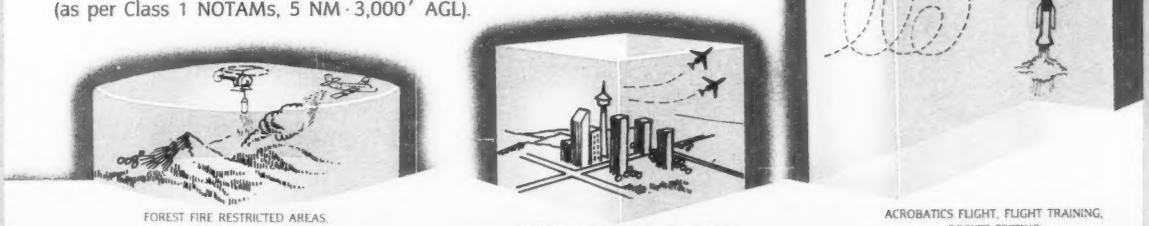
IFR:
- clearance is required from ATC

APPLICABILITY:
- includes all airspace above FL600
- includes all low level controlled airspace at and below 12,500′ ASL

CLASS 'F' REQUIREMENTS:
- generally uncontrolled unless specified by NOTAM, ATC or the Minister

NOTE: can encompass airspace of a specified dimension from the surface upwards

APPLICABILITY:
- includes Alert, Danger and Restricted Areas, Rocket Ranges, airspace reservations for State Visits, Military Flying (MFA) and Military Active (MAA) Areas, Temporary Flight Restrictions i.e. Forest Fires (as per Class 1 NOTAMs, 5 NM - 3,000′ AGL).



FOREST FIRE RESTRICTED AREAS, EMERGENCY USE, ETC

STATE VISTS, AIRSHOWS, MILITARY USE

ACROBATICS FLIGHT, FLIGHT TRAINING, ROCKET TESTING

Canada

TP 6010

and another slightly inland.

There is a large, full service, international airport and seaplane base at Juneau, as well as an FSS. Still Alaska's capital, Juneau offers plenty of accommodations for rest, relaxation, and recuperation before continuing into the heart of Alaska.

CONCLUSION

All of the routes over Canada to Alaska have some potential hazards for pilots who are used to depending upon constant NAVAID assistance or radar vectoring. This does not mean, however, that such flight over the north country is necessarily dangerous or difficult. If you are properly prepared and equipped, conversant with the rules devised for your protection, and able to make reasonably sound decisions on your own, you should have no difficulty. The journey may take longer than you had imagined, but the rewards can also exceed expectations in restoring a sense of adventure and accomplishment to your flying. Learning to look out for yourself, your companions, and your airplane with little or no assistance from ground facilities is an experience that can make you a better, safer pilot wherever you fly—over primitive mountains or over your own backyard. ■

FAA Aviation News would like to thank Transport Canada's John A. Pearson, Regional Aviation Safety Officer, Edmonton, Alberta; Brian Library of the Canadian Embassy in Washington, DC; FAA's Alaska Region's Tom Stuckey, Tim Lorenz, Charlene Derry, Valerie Aron, Kent Adams, and Clifford Smart; Roy Correl of Alaska Magazine; and Henry Ristic of the U.S. Customs Service for their help in providing information for this article.

—Editor.

Photographs are from the book Bush Pilots of Alaska *by Fred Hirschmann (price $36.95) copyright Graphic Arts Center Publishing Company, P.O. Box 10306, Portland, OR 97210.*

OTHER USEFUL PUBLICATIONS

The following Canadian brochures provide American visitors with information for planning trips to Canada. They discuss such things as Customs requirements; food, pets, and plants; vehicles and motoring; information for sportsmen; etc.

MAYDAY, MAYDAY, MAYDAY
(A-GA-143-001/TS-001)
Published by the Chief of the Defence Staff National Defence Headquarters, this publication provides important survival and search and rescue information. Copies are available from the National Defence Headquarters, 101 Colonel By Drive, Ottawa, Ontario CANADA K1A 0K2, ATTN: DAOT 5

Importing a Firearm or Weapon Into Canada
This pamphlet discusses the restrictions on importing various types of firearms and weapons into Canada. It describes what types of weapons are prohibited, restricted, or permitted. It outlines the requirements for obtaining import permits, declaration procedures, penalties,, and special permission for transporting handguns through Canada.
Revenue Canada
Customs and Excise Cargo and Release Division
Ottawa, Ontario
CANADA K1A 0L5
(613) 954-7129

United States

Airman's Information Manual
Published by the FAA, this is the official guide to basic flight information and ATC procedures in the U.S. It provides information on Customs procedures, flight planning, survival, and other important flight considerations. Copies are available at Government Printing Office Bookstores nationwide or order from GPO, Superintendent of Documents, Washington, DC 20402; (202) 512-3054; fascimile (202) 512-7703.

Alaska Tourist Package for Pilots
Prepared by the FAA Alaska Region's Flight Standards Division, this package contains information on routes, services, fuel, aviation facilities, frequencies, Customs requirements, weather, air traffic services, and survival tips for flying in Alaska. Contact Ms. Valerie Aron, Accident Prevention Program Coordinator, FAA, Flight Standards Division, 222 W. 7th Ave., Box 14, Anchorage, AK 99513; (907) 271-5912.

International Flight Information Manual
Published by the FAA, it provides official FAA information on basic international flight information. Copies are available from GPO, Superintendent of Documents, Washington, DC 20402; (202) 512-3054; facsimile (202) 512-7703.

Commercial Products

Aviation Visitor's Guide to Alaska
Published and sold by the Great White North Aviation Company, Inc., P. O. Box 140645, Anchorage, AK 99515-0645, this publication with subscription service for yearly revisions runs $40 for the initial copy and $15 a year for the update service. The publication contains information about Alaska airports, seaplane bases, heliports, fuel, lodging, facilities, services, contact names, and telephone numbers.

MILEPOST Plan-A-Trip Map
GTE Discovery Publications
P.O. Box 3007
Bothell, WA 98041-3007
1-800-331-3510.

AOPA Flight Planning Guide to Canada
AOPA Flight Planning Guide to Alaska
AOPA
421 Aviation Way
Frederick, MD 21701
(301) 695-2000
These booklets provide a wealth of information on flying in Canada and Alaska. However, they are not published annually, so dated information should be checked against some other source. Also, AOPA provides flight planning assistance to member pilots headed for Alaska.

"Alaska Highway Flight: An Adventure"
This is a 38 minute video shot from an airplane flying the Alaska Highway. The video provides an interesting view of the Alaska Highway flight route from the cockpit, including terrain, airports, and roads. The narration provides additional information on what pilots can expect during the flight. Copies are available from Transport Canada, Aviation Safety Programs, Western Region. Produced by Dakota Hills Video, Box 19, Deadwood, SD 57732. (605) 584-1530

Your Alaskan Flight Plan
2nd Edition
Don and Julia Downie
TAB Books Inc.
Blue Ridge Summit, PA 17294-0850
This 1989 paperback book by two veteran Alaska flyers is a good source of information on flying to Alaska. It covers trip planning, survival equipment, weather, mountain flying, Customs information, places to visit, etc.

The Loughead Brothers

Continued from page 6

observation of seagulls. By an ingenious system of struts and wires the biplane's entire lower wing could be positioned almost perpendicular to the airflow during landing. Another selling feature was that the wings could be folded back against the fuselage making storage possible in an ordinary garage. (Dan Denney must have studied his aviation history very well before he designed the popular *Kitfox*, a STOL single-engine kitplane with foldable wings.)

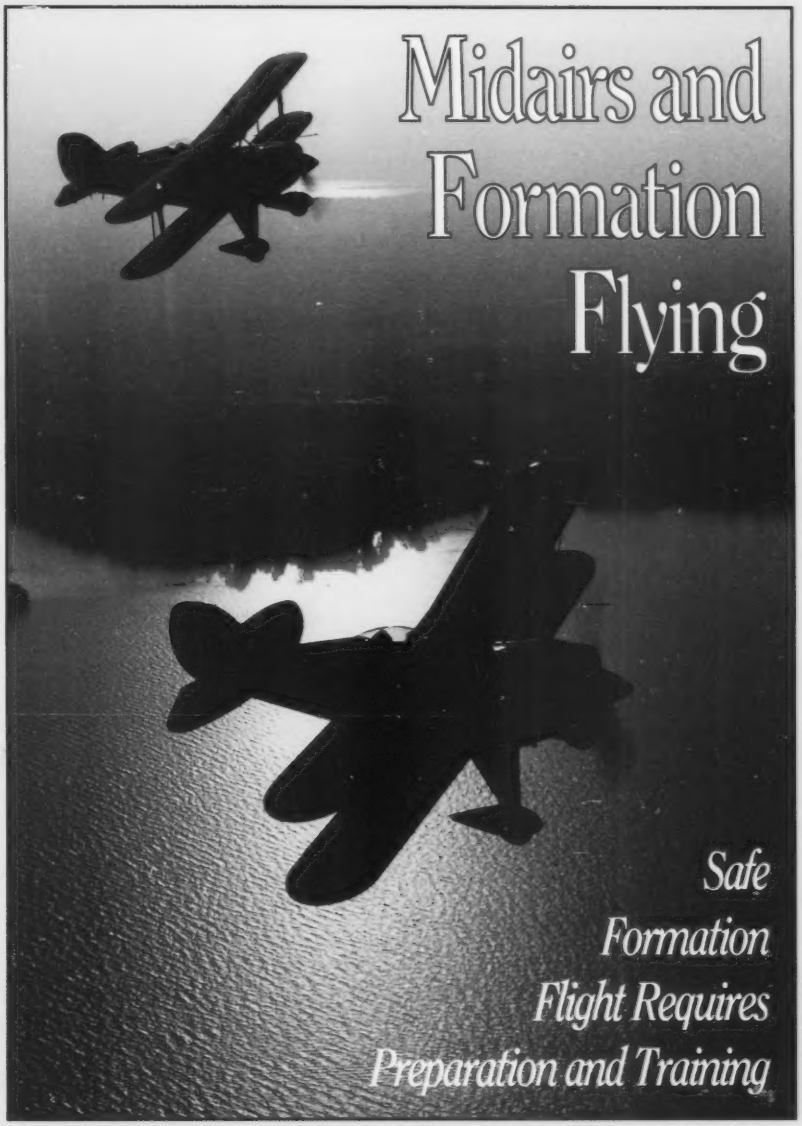
With all its features the S-1 should have been an outstanding success. However, the 1920 market was glutted with surplus World War I aircraft that could be bought for a song so the public was not interested in paying full price for a new aircraft. After spending nearly $30,000 on the project, the lack of buyers caused the company to be dissolved in 1921.

Malcolm decided to concentrate on the development of a hydraulic-brake system for automobiles and moved to Detroit. His new venture was a success. He soon appointed his brother Allan as the West Coast distributor, but Allan's first love was still aviation.

For the next five years Allan would stay in contact with John Northrop, who was working for Douglas Aircraft, and discuss possible design ideas. Finally, based on the reputation of Malcolm's brake company, a backer was found and Allan Loughead was back in the aviation business by the end of 1926. With the formation of the new company John Northrop returned as chief engineer and brought with him a design for a high-speed, four-passenger, single-engine, wooden transport aircraft. It featured an enclosed cockpit and was one of the first aircraft to incorporate a monocoque fuselage with a fully cantilevered wing. An aircraft built for speed, it would be called *Vega* and from it would evolve a whole family of variations —*Air Express, Explorer, Sirius, Altair,* and *Orion.*

In 1929 changes were occurring in the company which would severely affect its future. Northrop left to start his own company. Allan and his backers were bought out by the Detroit Aircraft Corporation. But the final blow came when the stock market crashed causing Detroit Aircraft to start siphoning off profits from its successful aircraft division to support the rest of the corporation. By 1932 the business had become another victim of the Depression. However, the name had a reputation for quality and would be retained to eventually become one of the leaders in aviation.

You say you have never heard of any Loughhead aircraft? Malcolm, tired of being called "loghead," began spelling Loughead the way it was properly pronounced. In Gaelic, the proper pronunciation of Loughead is "Lockheed." ■



Midairs and Formation Flying

Safe Formation Flight Requires Preparation and Training

Photo by David Gustafson

by Dean Chamberlain
Associate Editor

The pilots of these Pitts Special Biplanes, on their way to the Aerobatic Masters Contest last year in Fond du Lac, WI, are well-versed and well-rehearsed in the intricacies of close flight.

Midair collisions involving formation flight made headlines across the country during 1991. Probably the most widely reported was that of a helicopter and a Piper *Aerostar* over Philadelphia. The April 4 crash made national news because it involved the deaths of a U.S. senator on board the *Aerostar* and two school children on the ground, in addition to the deaths of both aircrews. The helicopter was flying an impromptu formation with the airplane to check if the *Aerostar's* landing gear was down and locked. On September 18th, *The Washington Post* reported the National Transportation Safety Board (NTSB) said one of the probable causes of the accident was lack of training. Apparently the *Aerostar's* crew should have known that when the landing gear is down, the landing gear's doors close and hide the locking mechanism. The helicopter just completed a second pass to check the gear when the collision occurred. The collision underscores the hazard involved when doing an impromptu formation flight with dissimilar aircraft during a stressful situation such as a potential landing gear problem.

As a result of the Philadelphia crash and

several other midair collisions during the year, *FAA Aviation News* reviewed the NTSB's accident records for general aviation aircraft to see if there were any common factors involving formation flying and midair collisions. From 1965 through the summer of 1991, the NTSB report listed 43 midair collisions involving some type of formation flight. Over this nearly 27 year period, there were, on average, about 1.6 formation flight related midairs each year. Some years there were no formation flight midairs reported. Other years had highs of three formation flight related midairs. The average of about 1.6 formation related midair collisions per year is part of an overall average of about 26 midairs per year from all causes from 1964 through June 30, 1991.

Although formation flight midairs represent less than 6.2 percent of all midairs based upon the above information, they are 6.2 percent that should never happen. They should also be the easiest midair collisions to prevent. The reason is both pilots involved know there is another aircraft close by. Each pilot is deliberately flying near the other aircraft. The accident reports indicate the typical formation flight midair is normally the result of carelessness on the part of one or more of the pilots involved.

A review of the NTSB report's narrative summaries revealed some interesting information about formation flight midairs and their causes. Some of these include:

1. Most of the pilots involved knew each other.
2. Not all of the midairs were fatal.
3. Some of the midairs caused only minor aircraft damage, and the aircraft were able to land.
4. A formation flight midair can happen to any type of pilot with any amount of flight time in any type of aircraft.
5. Prior formation experience does not necessarily protect pilots from midair collisions.
6. Most of the formation midairs occurred in VFR conditions
7. Many of the formations were impromptu flights with little or no prior planning or coordination.
8. Many of the aircraft involved were not in contact with air traffic control.

Based upon the reports and a review of the FAR as well as several sections of U.S. Army and Navy military flight manuals discussing formation flying, no pilot should ever fly in formation with another aircraft without adequate training and preparation. This training should include every pilot who will be flying in the formation using the actual aircraft that will be flown in the formation. Proper training is vital because accident history describes several occurrences in which one of the pilots either did an unexpected maneuver during the flight or failed to judge the closure rate of a dissimilar aircraft and hit the other aircraft.

Another common cause was what can best be described as a loss of situational awareness. One of the pilots either lost sight of the other aircraft or misjudged the space needed to complete a maneuver safely then hit the other aircraft. A number of the accidents occurred while the aircraft were being used for work. This may be significant only because the work involved may have diverted the pilots' attention away from controlling their aircraft properly. Four of the working accidents involved either airshow performances, aerobatic training, or aerobatic practice. Five of the accidents involved some form of aerial photography. One involved two crop-dusters spraying the same field. Two others involved either fire control or another type of controlled spraying. Two others involved general aviation aircraft and military aircraft.

The remaining formation midairs involved what could be described as routine types of flying. Pilots simply flying together. (No pun intended.) Alcohol was listed in only one of the reports as a contributing factor.

As all pilots know NTSB has specific definitions for accidents, incidents, and other such "accident" related terms. For those pilots not familiar with the Board's reporting procedures, it may include in its various reports, such items as its findings, probable causes, and factors relating to an incident or accident. In many of the formation midairs mentioned, the Board's findings included one or more of the following comments:

1. Planning-decision, improper: pilot in command
2. Over confidence in personal ability: pilot in command
3. Lack of total experience: pilot in command
4. Formation flying, improper: pilot in command
5. Clearance not maintained: pilot of other aircraft
6. Visual lookout not maintained: pilot of other aircraft
7. Diverted attention: pilot of other aircraft
8. Improper use of equipment/aircraft: pilot in command
9. Lack of recent experience: pilot in command
10. Visual lookout inadequate: pilot in command
11. Judgement, poor: pilot in command
12. Distance, misjudged: pilot of other aircraft

The Board then lists which findings were probable causes, and/or factors related to the accident. Not all of the findings may be listed as probable causes or factors in an investigation. The Board also lists findings for each pilot involved. The NTSB may indicate probable cause for only one pilot, but both pilots are involved in the accident.

Since we are looking for ways to avoid midair collisions when flying in formation, what lessons can be learned from the midairs listed by NTSB? The simple answer is for a pilot not to do any of the things the Board listed as findings in previous midairs. To avoid doing any of the listed findings, we must go back to our original conclusion which said, "No pilot should ever fly in formation with another aircraft without adequate training and preparation."

This training should include every pilot who will be flying in the formation using the actual aircraft that will be flown in the formation. Training should start with a review of FAR § 91.111, Operating near other aircraft which states that:

(a) No person may operate an aircraft so close to another as to create a collision hazard.

(b) No person may operate an aircraft in formation flight except by arrangement with the pilot in command of each aircraft in the formation.

(c) No person may operate an aircraft, carrying passengers for hire, in formation flight.

The FAR require prior arrangement with all pilots in command flying in the formation, and its prohibits formation flights involving aircraft carrying passengers for hire. Since formation flights cannot involve paying passengers, we need to concentrate on sections (a) and (b). The question is how can we safely operate two or more aircraft in formation without creating a collision hazard. The second part of that question is what kind of prior arrangements can prevent a midair collision between the pilots involved in a formation flight.

Because of the number of formation related midairs this summer, the FAA Flight Standards Service released the following comments this summer through its Accident Prevention Program on formation flight safety. The comments and suggestions provide some good guidance for would-be formation pilots. Included are some comments taken from various military training manuals.

First we must define what the FAA considers a formation flight. The FAA's *Airman's Information Manual* defines formation flight as, "More than one aircraft which, by prior arrangement between the pilots, operate as a single aircraft with regard to navigation and position reporting. Separation between aircraft within the formation is the responsibility of the flight leader and the pilots of the other aircraft in the flight. This includes transition periods when aircraft within the formation are maneuvering to attain separation from each other to effect individual control and during join-up and breakaway." The definition also describes both standard and nonstandard

formations. A standard formation is one in which a proximity of no more than one mile laterally or longitudinally and within 100 feet vertically from the flight leader is maintained by each wingman.

As you can see, you can be flying in formation and still keep a safe distance between aircraft. The problem seems to develop when pilots want to fly very close together. Some of the ways to avoid a formation disaster was released to the Accident Prevention Program Managers (APPM) at the various Flight Standards District Offices around the country for use in their local accident programs include:

1. The need for proper prior planning. This should include planned flight courses to be flown, separation distances between aircraft, altitudes involved, join-up and breakaway procedures, signals and communications procedures, and the need to maintain constant radio contact between aircraft if possible. Emergency procedures should be discussed in case of any problems. One of the U.S. Navy manuals consulted discussed the need for procedures in case one of the aircraft approaching the flight leader had either an excessive closure rate or acute bearing angle on the leader. Excessive closure rates between formation aircraft resulted in several midair collisions discussed in several of the NTSB briefs. The Naval flight manual provided two important comments that can be used by all formation pilots, military or civilian, to increase safety. One stated, "Leaders shall endeavor to fly as smoothly as possible and avoid unnecessary altitude, heading, and power changes." The other statement was simpler and more direct. It said, "Keep the leader in sight at all times throughout this maneuver." If some of the pilots listed in the NTSB report had followed these two ideas, many of the accidents reported might have been avoided.

2. Another Flight Standards suggestion was, "Pilots should be mindful of any aerodynamic interference between the aircraft in proximity, e.g., downwash, propwash, wake vortices, differing size, speed, and configuration of the aircraft as well as different categories of aircraft can all cause varying degrees of interference that the pilot must anticipate and correct for without endangering the remainder of the formation. This type of problem caused one midair between a Bucker Jungmann and a Pitts' Special in 1984 when they tried to fly a "mirror fly-by" aerobatic maneuver. Initially, the two aircraft were forced apart by the airflow over their wings when they tried the maneuver with the Bucker inverted and the Pitts flying underneath it with their wings basically wing over wing. To compensate for the problem, the Pitts moved ahead of the Bucker. When the wings were unlapped, the Pitts was drawn into the Bucker's prop. The prop caused extensive damage to the Pitts' vertical tail. Both aircraft were able to land.

U.S. Air Force Photo

The ultimate in formation flying: A tanker refuels an F-15 Eagle in flight over Edwards Air Force Base, CA. Although air-to-air refueling is done thousands of times a year, this type of formation flying is never taken lightly when it comes to safe separation.

3. Another APP discussion point was, "Aircraft of different size may also pose visual misperceptions, e.g., a smaller aircraft may be closer that it appears to the pilot of a larger aircraft. Pilot perspective from a tandem cockpit versus side-by-side seating also introduces visibility implications that are critical when operating in formation flight."

4. Also discussed was the importance of the formation's "collective" formation experience. Pilots with hundreds of hours of formation flight experience, but who have never flown in formation together may require the same level of coordination and practice as pilots completely inexperienced with formation flight. The NTSB report shows that former military pilots who have extensive formation flight experience as well as ATP rated pilots are not immune from a formation midair.

The memo sent to the Accident Prevention Program managers across the nation concluded by discussing the dangers of impromptu formation flight and the need for proper coordination and training before attempting formation flight.

For those pilots who still want to fly formation flight even after considering the increased midair risk because of the proximity of the other aircraft, we suggest that after working out all of the possible procedures needed to ensure flight safety while still on the ground, pilots start the actual practice flights with their aircraft widely separated. Only after enough practice has instilled the necessary flight discipline in all pilots involved should the distance be reduced between the aircraft. The distance should never be reduced to the point where a sudden gust of air or a pilot's momentary inattention will cause a collision. The Navy and Army formation flight procedures reviewed for this article always provide for both vertical and horizontal separation between aircraft. Both services' manuals also provide contingency plans for emergencies. Weekend formation pilots should also plan for emergencies. Unless you are a member of one of the DOD flight demonstration teams, either a Navy "Blue Angel" or an Air Force "Thunderbird" and are well-trained in close, wingtip flying, weekend formation pilots should keep a safe distance between their aircraft. With proper planning, plenty of practice, and a safe distance between aircraft, weekend formation pilots can fly safely together and avoid the unpleasant prospect of becoming a NTSB formation midair statistic. ■

FLIGHT**FORUM**

• In Search Of

I need some help in locating information about Bessie Coleman. In the early 1920's flight training was not available to Black Americans in the U.S. She received her licenses in France and flew as a professional aerobatic pilot in the U.S. until her untimely death in 1926 in an aircraft accident.

I am particularly interested in information about her brief stay in California. While there, she purchased two airplanes and, as a result of an airplane accident, spent time in a Los Angeles area hospital. If there are any readers who have some information they wish to share with me, I would appreciate a reply. Thanks.

Ben Henderson
2840 D Street
Hayward, CA 94541

• Weather Option—Instant Replay

In the September/October 1991 "FlightFORUM" letter, "Weather Options," you state that in the absence of a terminal forecast an airport cannot be filed as an alternate. I disagree with your analysis.

In FAR § 91.169(c), "forecasts" is plural and there is no mention as to the type of forecast (i.e., terminal, area, TWEB route). You reference TERPS para 122, but this paragraph does not mention forecasts. The Terminal Procedures Publication (TPP) states that alternate airports must have weather reporting factilities and monitored navigational aids. Forecasts are, again, not mentioned. In fact, many airports without terminal forecasts are authorized as alternates in the TPP.

Based on this, it is my opinion that, in the absence of a terminal forecast, the area forecast can be used to determine forecast alternate weather conditions. A limitation on the area forecast is that, because of its scope, usually the lowest weather forecast is ceilings less than 1,000 feet, visibility less than three miles. Since the product does not specify how much lower than 1,000 and three, such a forecast would eliminate any airport as an alternate.

Terry Lankford
Pleasanton, CA

Yes, you may use an area forecast to determine if you have alternate weather minimums; however, the airport may not be authorized for use as an alternate airport if weather observing and reporting capability is not available. In the case of FAR Part 135 operations, weather reports are required before commencing the approach at both destination and alternate airports. Airports not appropriate for use as alternate airports are identified by the symbol A NA on the instrument approach plate.

• IQ Test Results

When I received the May/June 1991 issue of FAA Aviation News *I decided to try the quiz on page 17, "Test Your Pilot IQ—Airport Environment." I hate to say this, but I disagree with one of your answers. If you are correct, then I have been doing things wrong for the 22-plus years I have been a controller and the 30 years I have been a pilot. According to the answer key you supplied on page 15, the answer to question #1 was a. or true—you have to read back all clearances issued by a controller. I believe the answer should be b. or false. I have practiced the procedure in the* Airman's Information Manual *which indicates that readbacks are "good operating practice" but not mandatory.*

Robert V. Ensten
Air Traffic Manager
San Carlos, CA

Mr. Ensten is absolutely correct, and, believe or not, we knew the correct answer to question #1 in our first quiz should have been listed as b. or False. AIM, paragraph 4-68.b.1 indeed states that it is a good operating practice for pilots to acknowledge " . . . all runway crossings, hold short, or takeoff clearances . . . " Paragraph 4-68.b states, "Pilots or airborne aircraft should read back those parts of ATC clearances and instructions containing altitude assignments or vectors as a means of mutual verification." Again, the instructions are not mandatory.

Perhaps we were so excited about our new color format (that was the first issue) that we did not check the answer key closely enough. Rest assured, we have double, double-checked the answer key for the quiz in this issue. Now that we have said that, one of our eagle-eyed (and probably smarter) readers will spot something. Keep the cards and letters coming in; we need the humility.

• Foreign Currency

We are a German flight group that operates an "N" (United States) registered Fan Jet Falcon 20 and a Beech King Air in both Europe and North America. We all have U.S. licenses with instrument ratings based on our German licenses (FAR § 61.75) and we keep our licenses current under German regulation. This is the dilemma, half of the pilots think we must maintain FAA flight reviews (FAR §§ 61.56 and 61.57) and pilot proficiency checks (FAR § 61.58) even though we still do our German equivalent checks to keep our German licenses current. Who is right?

Other pilots in Europe have the same question. We all enjoy reading your publication when we can get it.

Name withheld

If the operation being conducted requires the use of a U.S. pilot certificate, whenever the pilot is flying, he/she must be in compliance with all recency of experience and currency requirements under FAR Part 61.

Photo courtesy of Bell Boeing

• Forecasting the Future

After reading your article on forecasting aviation's future in your May/June issue, I wondered how the economics of the future will further affect the design of large jet aircraft. Today, it appears that the tide of environmental concern and real estate are winning over the desire to have faster economical aircraft. Had we begun to build jet transports with the capabilities to fly slow and land shorter during the last decade, the cost of providing ground space and airspace for their use during the forecast period might have been dramatically altered.

Environmentally, it is the aircraft with the capability to ascend and descend more steeply that irritates the least number of people on the ground. If passengers knew it was safer, would they not be willing to pay a slight premium to ride on a transport with the capability to slow down below 100 knots and descend on a ten degree glide slope? I make the assumption here, that cruise speeds and safety are not compromised.

Imagine, doubling the number of runways per airport, reducing the size of holding patterns, having more flexibility to place aircraft in trail, and getting all departures above 10,000 feet in less than five miles! The technology is available, and I believe that the improvement would pay for itself.

John C. Miller
Randleman, NC

We appreciate the concerns you expressed in your letter and assure you that the FAA is actively following the development of new aircraft designs, such as the tiltwing and the tiltrotor.

THE FUTURE OF COMMUTER AIRCRAFT

With a nickname like "The Skunk Works" you might think that only something malodorous would emerge from Lockheed's Advanced Development Company (ADC). Quite the contrary; in the aerospace industry, Lockheed's ADC has a well-respected position in the design and production of spacecraft and associated high-tech systems. Its latest development is the "Personnel Launch System" (PLS) or HL-20.

If the HL-20 looks familiar, it should. It is based on a lifting body design from the 1960's called the "Flying Bathtub," whose test flights led to the development of the Space Shuttle Orbiter. Lockheed and the National Aeronautics and Space Administration (NASA) see the HL-20 as a commuter craft for shuttling crews and cargo to and from the Space Station Freedom.

The HL-20 has a wing-span of 23 feet and a length of less than 30 feet, making it one-quarter the size and 10% the weight of the Orbiter. Three or four vehicles would likely operate from the Kennedy Space Center in Florida. Despite its obvious physical resemblance to the Orbiter, HL-20 would complement, not replace the Shuttle. In addition to transporting personnel and cargo, its missions could include satellite servicing, orbital rescue, and payload delivery and return.

Lockheed and NASA are working with the prototype and conducting feasibility studies. They hope to conduct unmanned flight test validation by 1995 and to carry the first human crew by the end of the century. The HL-20 would be launched from a Titan III rocket and would return to earth to land much like the Orbiter does now.

Pilots, if you are into "people moving" and you have a flexible travel schedule, you could be flying this new type of commuter aircraft by the turn of the century. Let us hope NASA "makes it so."

NASA Photo

CREDIT WHERE IT'S DUE

We had so many photos in the November/December 1991 issue that it was inevitable that we would leave out a photo credit or two.

The picture of the Ninety-Nines Headquarters on page 1 was sent us by Loretta Gragg, the Ninety-Nines' Executive Director. The picture of Amelia Earhart on page 2 was courtesy of the Smithsonian Institution's National Air and Space Museum Photo Library, as was the sketch from which we made the illustrations of the ballooning Blanchards on page 15. Also, although we identified her correctly in the article, we misidentified Colleen Nevius in the caption with her picture on page 5. Ms. Nevius is Executive Director of the Whirly-Girls, not its president.

If any of our readers have good color photographs or slides or even artwork of interesting aviation operations or events, please pass them along to us for possible use in an upcoming issue. The pay is low (there is none), but we promise we will not forget your photo credit. Send them to Editor, *FAA Aviation News*, AFS-810, Washington, D.C. 20591. We will return them upon request.

PIREP'S—A POUND OF ICE, AN OUNCE OF KNOWLEDGE

"Heavy Icing?" Could it be that a new rock group has arrived from Norway? That phrase certainly has no reportable value of icing intensity.

The National Weather Service (NWS) long ago established four categories for the reporting of icing conditions: trace, light, moderate, and severe. Yet, the use of a fifth category, "heavy," continues to receive acceptance by enough pilots that it can only cause confusion in the pilot reporting (PIREP) process.

FAA has found that the pilot who reports "heavy" icing is usually referring to ice conditions that are moderate or that vague area between moderate and severe. Many of these reports are transmitted to the NWS or the FAA with urgent headers, which could be misleading. The four recognized categories for reporting icing are the only reportable values allowed.

A meteorologist is often placed in the uncomfortable position of having to decipher the intent or meaning of "heavy" icing PIREP. Forecasts and advisories issued by NWS around the nation are strongly dependent upon the timely receipt of PIREP's that are encoded accurately. Other pilots and briefers with access to PIREP information may also be confused by the use of vague and improper terms. It is incumbent upon FAA and NWS personnel to be responsible for the correct transmission of pilot reports dealing with icing. In order to accomplish this, it may be necessary to "cut through all the heavy icing" and get to the real meaning.

So, pilots, say what you mean and mean what you say, but when you are talking about intensity of icing, remember, it is either trace, light, moderate, or severe (see the Airman's Information Manual, paragraph 7-20 for a description of each).

Reprinted from an article by Mr. Howard Bookman, CWSU Atlanta, which originally appeared in FAA's Air Traffic Bulletin, *published by the Associate Administrator for Air Traffic.*

ANSWERS TO QUIZ ON INSIDE BACK COVER

1. C [FAR § 61.57(c)]
2. B [FAR § 61.57(e)(1)(i)]
3. A [FAR § 91.3 (c)]
4. D [FAR § 91.17(a)(1)-(4)]
5. A [FAR § 91.113(c)]
6. A [FAR § 91.117(a)]
7. D [FAR § 91.151(a)(1)]
8. A [FAR § 91.157)]
9. A [FAR § 91.185(b)]
10. C [FAR § 91.119(a) & (c)]

AVNEWS/BRIEFS

CFI/AMT OF THE YEAR AWARDS

On November 18, 1991, the General Aviation Industry Awards Program honored Lloyd J. Probst of Montgomery, AL, as Flight Instructor of the Year and Emerson "Cub" Stewart, Jr., of Waynesville, OH, as Maintenance Technician of the Year at ceremonies in Washington, DC.

Instructor of the Year Lloyd Probst has freely given his time and expertise in the promotion of general aviation and aviation safety. A retired U.S. Air Force command pilot, instructor, and pilot examiner, Probst's civilian aviation career includes being a "Gold Seal" flight instructor since 1969, a corporate pilot, a manager of flight training at Auburn University, and a chief flight instructor for the Maxwell-Gunther Air Force Flying Club. He has been an active promoter of the FAA Pilot Proficiency Awards ("Wings") Program since its inception and an FAA Accident Prevention Counselor for the last 10 years. He also acts as a merit badge counselor to the Boy Scouts of America and is a frequent Civil Air Patrol and flying club guest speaker.

Emerson "Cub" Stewart was honored for maintaining the highest standards of quality in his profession and generating untold goodwill for the entire general aviation community. Stewart grew up in aviation at the Waynesville Airport, which is still operated by the Stewart family. A certificated Airframe and Powerplant Maintenance Technician since 1965, he received his formal A & P training at Parks College in St. Louis. However, his interest in maintenance goes back even further as he assisted in his first major aircraft engine overhaul at age 14. In addition to his A & P duties and his airport operations responsibilities, Stewart, who is also a CFI, served in the Air National Guard as both a maintenance technician and crew chief.

Both men and their families were brought to Washington, DC for the awards ceremony, at which time the General Aviation industry rewarded them with several thousand dollars worth of cash, gifts, and aviation equipment.

PIPELINE PATROL PILOTS AND DRUG TESTING

On November 14, 1988 FAA issued a final rule requiring specified aviation employers and operators to implement anti-drug programs for personnel performing sensitive, safety and security related functions. FAA has amended that rule several times to address implementation problems and to clarify the requirements of the rule. The effective date for operators other than those who do not require a FAR Part 121 or 135 certificate was December 21, 1988 with various implementation dates thereafter as described in FAR Part 121, Appendix I, Section IX.A., paragraphs 2-4.

On September 5, 1991, FAA issued an amendment to the rule excluding most operators that come under FAR § 135.1(c). The effective date of that change was October 5, 1991. Those who conduct sightseeing flights in an airplane or rotorcraft for compensation or hire will be subject to drug-testing. However, the question has arisen about pilots conducting pipeline patrols under a waiver of the FAR Part 91 and their need for drug testing.

The Pipeline Safety Regulations answer the question. Also in November of 1988, the Research and Special Programs Administration (RSPA) of the Department of Transportation issued a final rule that required operators of pipeline facilities used for the transportation of natural gas or hazardous liquids and operators of liquified natural gas facilities to have an anti-drug program for employees who perform certain sensitive or safety-related functions covered by the pipeline safety regulations (Title 49 of the Code of Federal Regulations, Part 199).

Under these regulations, a pilot who performs aerial pipeline surveys to satisfy the requirements of 49 CFR § 192.613, and who observes and records changes in the pipeline, would be subject to the drug testing requirements of 49 CFR Part 199 although that pilot would not be required to do so under the FAR. If a pilot and an observer are on board the aircraft and the observer were the person responsible for observing and recording changes in the pipeline, the pilot would not be subject to any drug testing program under the relief provided by FAR § 135.1(c). However, the observer would be subject to drug testing under 49 CFR Part 199.

For further information on pipeline drug testing requirements, contact Mr. Richard L. Rippert, DOT, RSPA, Pipeline Safety Enforcement, DPS-20, Washington, DC 20590, (202) 366-6223. For information on all other aviation related drug testing requirements, contact Mr. William R. McAndrew, FAA, Office of Aviation Medicine, Drug Abatement Branch, AAM-220, Washington, DC 20591, (202) 366-6710.

NIGHT FLIGHT EXPERIENCE EXPLAINED

Does an applicant for a private pilot certificate need any night flying experience to take the private pilot flight test? The answer to that question has caused confusion around the country recently. The answer is yes, an applicant for the private pilot flight test must have had *some* training in night flying before being allowed to take the private pilot flight test.

What apparently is causing the confusion is that there are two different FAR sections that apply. FAR § 61.107(a)(9) and (b)(6) state an applicant for a private certificate, airplane and helicopter respectively, must have received instruction in night flying, including takeoffs, landings, and VFR navigation, but it does not specify how much instruction is required. Then FAR § 61.109(a)(3) states a private pilot applicant who wants night flying privileges must have logged three hours at night, including 10 takeoffs and landings. Applicants who do not have three hours of night experience and 10 takeoffs and landings receive a private pilot certificate with the limitation, "Night flying prohibited." This limitation may be removed when the pilot meets the flight time and takeoff and landing requirements.

So, based upon the two FAR sections, an applicant for the private pilot flight test must have received some instruction in night flying, but the applicant does not have to have a specified amount of night experience unless the applicant wants an unrestricted private pilot certificate.

COMPUTER AGE AIRMAN TESTING

FAA has approved Drake Training and Technologies (DT&T) as the second computer-testing organization for FAA written airman exams. Applicants now can go to DT&T, take a computerized version of one of the airman written tests, and receive the test results minutes after completing the test. The FAA private pilot, commercial pilot, and instrument pilot written tests can be taken at the numerous DT&T Testing Centers across the country.

Applicants interested in DT&T's testing program can call DT&T at 1-800-FLY-FAST for a list of the testing sites. Applicants are reminded that computerized test results must have the official DT&T embossed seal on the report to be accepted as a valid test result by either a designated pilot examiner or FAA inspector for processing.

TEST YOUR PILOTING IQ:
FAR Refresher

For those of you who have taken some time off from flying over the long, cold winter, we hope your aeronautical knowledge does not go into hibernation with your flying skills. Before your thoughts turn toward taking flight again in the spring and just in case a few of the FAR fade from memory, here is a little refresher to make sure you do not lose ground for next season's offering of safe and entertaining flight.

By the way, this is NOT an open FAR quiz; test your memory before you check the FAR for the answers. (Otherwise it is not a quiz, right?) Answers and FAR references are on page 27.

1. In order to meet the general recency of experience requirements, Pilot A, who wants to fly a PA-18 and carry a passenger, must have which of the following within the preceding 90 days:

   a. Three takeoffs and landings to a full stop in any airplane.
   b. Three takeoffs and landings as sole manipulator of the controls in any airplane.
   c. Three takeoffs and landings as sole manipulator of the controls in a tailwheel airplane to a full stop.
   d. Three takeoffs and landings in a single-engine land airplane.

2. Pilot B, who is instrument rated, wishes to fly an appropriately equipped PA-28 from Smalltown USA to Anytown USA, but the weather conditions are less than VFR minimums. To be pilot-in-command of this flight, Pilot B must have, within the preceding six months, which of the following:

   a. At least six precision approaches and three non-precision approaches in an airplane.
   b. At least six hours of flight time under simulated or actual IFR conditions with at least three hours of that in an airplane and at least six instrument approaches or passed an instrument competency check.
   c. At least six hours of flight time under simulated or actual IFR conditions with at least three hours of that in an airplane and at least six instrument approaches and passed an instrument competency check.
   d. At least three precision approaches and three non-precision approaches and at least six hours in a simulator.

3. After an in-flight emergency where a pilot deviates from a regulation to meet the emergency, the pilot must do which of the following:

   a. Nothing, unless requested to write a report of the incident by a representative of the Administrator.
   b. Notify air traffic control of the rule violated.
   c. Meet with an aviation safety inspector or face suspension of the pilot's certificate.
   d. Enter a record of the incident in the pilot's logbook.

4. No person may act as a crewmember of a civil aircraft—

   a. Within eight hours after consuming any alcohol.
   b. While under the influence of alcohol.
   c. With a .04% blood alcohol level.
   d. Any of the above.

5. The aircraft which has right-of-way over all other aircraft is:

   a. An aircraft in distress.
   b. A balloon.
   c. An airship.
   d. An instruction flight simulating an emergency.

6. When operating below 10,000 feet MSL, the maximum indicated airspeed at which an aircraft can fly is:
   a. 288 m.p.h.
   b. 200 knots.
   c. 230 m.p.h.
   d. 250 m.p.h.

7. For a daytime flight in an airplane in VFR conditions at normal cruising speed, the PIC must assure there is sufficient fuel on board to:

   a. Fly to the point of intended landing and for 45 minutes beyond.
   b. Fly to the first point of intended landing, to a second airport within 50 nautical miles, and for 30 minutes beyond.
   c. Fly to the point of intended landing only.
   d. Fly to the point of intended landing and for 30 minutes beyond.

8. When operating in a control zone under a special VFR clearance at night, the pilot of an aircraft other than a helicopter must:

   a. Remain clear of clouds and have at least one statute mile of flight visibility, hold an appropriate instrument rating, meet the currency requirements of FAR Part 61, and have an appropriately equipped aircraft.
   b. File an IFR flight plan.
   c. Broadcast position reports every five minutes until clear of the control zone.
   d. Have a ground visibility of one mile.

9. While on an IFR flight plan, the aircraft experiences two-way communications failure but is in VFR conditions. The pilot shall continue the flight:

   a. Under VFR and land as soon as practicable.
   b. By the route assigned in the last ATC clearance.
   c. By the route ATC advised the pilot to expect.
   d. By the route filed in the flight plan.

10. When operating an airplane over a congested area of a city, town, or settlement or over an open air assembly of people, the aircraft's minimum safe altitude should be:

    a. 2,000′ AGL.
    b. 500′ AGL.
    c. 1,000′ above the highest obstacle with a horizontal radius of 2,000′ of the aircraft and at an altitude that allows for a safe emergency landing in the event of an engine failure.
    d. 1,000′ MSL.

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DO NOT DELAY – CRITICAL TO FLYING SAFELY!

Photo by Fred Hirshmann

Lake Clark, south of Anchorage and on the west side of Cook Inlet, reflects Tanalian Mountain and two floatplanes used by the National Park Service and the Alaska Department of Fish and Wildlife Protection.